S. HRG. 100-489

COAL DISTRIBUTION AND UTILIZATION ACT OF 1987

HEARING

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

FIRST SESSION

ON

S. 801

TO FACILITATE THE NATIONAL DISTRIBUTION AND UTILIZATION OF COAL

SEPTEMBER 10, 1987

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Committee on Energy and Natural Resources

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COAL DISTRIBUTION AND UTILIZATION ACT OF 1987

THURSDAY, SEPTEMBER 10, 1987

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 9:34 a.m., in room SD-366, Dirksen Senate Office Building, Hon. J. Bennett Johnston, chairman, presiding.

OPENING STATEMENT OF HON. J. BENNETT JOHNSTON, A U.S. SENATOR FROM THE STATE OF LOUISIANA

The CHAIRMAN. The hearing will come to order.

Today the committee will hear testimony on S. 801, the Coal Distribution and Utilization Act of 1987, which would provide Federal eminent domain authority for coal slurry pipelines.

I have long been an advocate of coal slurry pipelines since I believe that they will yield enormous benefits to our Nation in the form efficient and economical transportation of our vast coal resources.

Recent world events emphasize the importance of energy security and U.S. independence in the energy arena. Many ingredients go into achieving this independence. But in my view a crucial component is a healthy coal industry. For our U.S. coal industry to thrive, it must achieve and maintain competitiveness in a world market. And it is essential to competition that the cost of coal transportation be reasonable. Coal slurry pipelines are a key to achieving that end.

A report issued this summer by the National Coal Council states that the total cost of transporting export coal is the most significant factor affecting international competitiveness of the U.S. coal industry. The Energy Information Administration estimates that by 1995 coal pipeline rates would be anywhere from $12 to $20 per ton less than railroad rates.

Our coal industry simply cannot be expected to compete when it costs Appalachian shippers more to send coal by rail to New England than for western Canadian producers to ship it there by way of the Panama Canal. Recent purchases of foreign coal by utilities in Florida, Virginia, and Texas serve as warning signs of what may be in store for the domestic industry in the future if transportation costs are not kept in check.

However, while several coal slurry pipeline projects have been proposed in the United States, these projects have been terminated or suspended due to difficulties in implementation. At the same time, foreign countries, such as the U.S.S.R., apparently see the wisdom of constructing these pipelines and are forging ahead with their coal slurry projects.

Here at home obtaining rights-of-way for the pipelines, particularly across railroad lands, has been a major stumbling block to construction. S. 801 introduced by myself, cosponsored by Senator McClure and 15 others, would solve this problem by providing Federal eminent domain authority for pipelines deemed to be in the national interest.

Similar bills were favorably reported by this committee in the 97th and 98th Congresses. S. 801 incorporates essentially the same language relating to environmental protection and State water rights as previously approved by this committee.

[The text of S. 801 follows:]

II

100TH CONGRESS
1ST SESSION

S. 801

To facilitate the national distribution and utilization of coal.

IN THE SENATE OF THE UNITED STATES

MARCH 19 (legislative day, MARCH 17), 1987

Mr. JOHNSTON (for himself, Mr. BRADLEY, Mr. BREAUX, Mr. BUMPERS, Mr. DECONCINI, Mr. MCCAIN, Mr. MCCLURE, Mr. MATSUNAGA, Mr. MURKOWSKI, Mr. NICKLES, and Mr. STEVENS) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

A BILL

To facilitate the national distribution and utilization of coal.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Coal Distribution and Utilization Act of 1987".

FINDINGS AND PURPOSE

SEC. 2. (a) The Congress hereby finds and declares that—

(1) the continuing dependence of the United States on foreign sources for petroleum and petroleum products entails grave national security risks, results in

major balance-of-payment deficits, and increases inflation and unemployment in the domestic economy;

(2) the United States possesses extensive coal reserves that must be produced, distributed, and utilized to reduce the Nation's dependence on imported petroleum;

(3) domestic coal reserves cannot be developed and used for fuel unless adequate transportation systems and facilities exist for the efficient and economic distribution of large quantities of coal across great distances to markets in interstate and foreign commerce at competitive prices;

(4) the Nation's coal distribution system must include interstate coal pipeline distribution systems that will assist the Nation in the development and efficient utilization of coal resources;

(5) the construction of interstate coal pipeline distribution systems to distribute domestic coal will be facilitated by granting the power of eminent domain to certain interstate coal pipeline distribution systems;

(6) the construction of interstate coal pipeline distribution systems is a public use that justifies granting the Federal power of eminent domain to those systems for which a determination of national interest has been made pursuant to this Act;

(7) the water resources of the States are necessary for the development of other resources within those States, and State water laws or terms and conditions of permits and authorizations for the appropriation, use, and diversion of water that restrict, limit, or condition the export of water in interstate coal pipeline distribution systems are reasonable and permissible means for the protection of the resources and the public interests of States;

(8) State water law and interstate compacts are carefully balanced and structured systems for the allocation of water;

(9) the national interest is best served by developing interstate coal pipeline distribution systems pursuant to those State water laws, interstate compacts, and laws governing the interstate allocation of water, including, notwithstanding any adverse impact such law may have on interstate commerce, laws relating to or prohibiting the export or use of water within or outside the State granting or denying such export or use; and

(10) the need for a national coal distribution system is subservient to the national interest in the primacy of State water law, interstate compacts, and laws governing the interstate allocation of water.

(b) The purpose of this Act is to facilitate the development of interstate coal pipeline distribution systems by granting the Federal power of eminent domain to those interstate coal pipeline distribution systems that are determined to be in the national interest: *Provided*, That such development is subject to State water law, interstate compacts, and laws governing the interstate allocation of water.

DEFINITIONS

SEC. 3. For the purposes of this Act the term—

(1) "coal" means any of the recognized classifications of coal, including anthracite, bituminous, semibituminous, subbituminous, and lignite;

(2) "interstate coal pipeline distribution system" means any pipeline system the primary economic purpose of which is the distribution of coal in a liquid or solid state—

(A) from one or more points outside a State to one or more points within a State or between two or more points within a State through another State, or

(B) from one or more points within Alaska to one or more points in a foreign country. Such a pipeline system shall be deemed to be in interstate or foreign commerce if coal that enters the pipeline system is delivered for commercial use in a

State other than Alaska, in a territory of the United States, or in a foreign country.

An interstate coal pipeline distribution system includes line pipe, valves, pumping stations, water supply pipelines, and such dewatering facilities as are necessary. Such systems shall not include rail, port, highway, or other ancillary coal-gathering or coal-storage facilities.

(3) "private lands" means any interest in any land other than interests—

(A) owned by the United States or agency thereof or owned by any State or any political subdivision thereof;

(B) held in trust by the United States for an Indian or Indian tribe or owned by an Indian or Indian tribe subject to a restraint against alienation imposed by the United States; or

(C) owned by a regional or village corporation established under the Alaska Native Claims Settlement Act, as amended, if such land was transferred to such corporation pursuant to said Act;

(4) "right-of-way" means such interest in private lands, excluding any interest in water, as may be necessary for construction, operation, and maintenance of an interstate coal pipeline distribution system;

(5) "Secretary" means the Secretary of Energy or his successor;

(6) "State" means a State of the United States and the District of Columbia; and

(7)(A) "State water law" includes but is not limited to all substantive and procedural State constitutional provisions, statutory law, judicial decisions, administrative regulations, and administrative decisions authorized by the State which apply to water; and

(B) in the case of any State water law which might be argued to be invalid as an improper burden, interference, or regulation of interstate commerce, such State water law shall not be deemed to be invalid for that reason insofar as such law applies to the export or use of water within or outside the State granting or denying the export or use of water for any interstate coal pipeline distribution system. State water law includes both existing law and that new law properly enacted or created in the future.

EMINENT DOMAIN AUTHORITY

SEC. 4. (a) AUTHORITY TO MAKE NATIONAL INTEREST DETERMINATION.—(1) Upon application of any person proposing to construct an interstate coal pipeline distribution system, who has filed and secured approval of a water permit or acquired other appropriate authorization to control, reserve, appropriate, purchase, transfer, use, export, divert, dedicate or claim water under State water law as provided in section 5, the Secretary shall determine whether the construction of such system is in the national interest.

(2) The determination of the Secretary under paragraph (1) shall be based on the record as a whole, taking into consideration each of the criteria set forth in subsection (b).

(b) FINDINGS.—In making a determination under subsection (a) the Secretary shall make findings concerning the extent to which the system—

(1) would help meet national needs for coal distribution and utilization considering, among other matters, alternative routes, or means of distributing coal;

(2) would enhance competition and provide new market outlets and opportunities for coal producers, including small and independent producers;

(3) would contribute to the national security by encouraging the displacement of imported petroleum, petroleum products, and coal with domestic coal;

(4) would result in economic benefits including—

(A) reduced coal transportation costs;

(B) reduced wholesale and retail electric rates; and

(C) enhanced reliability of supplies of both coal and electric energy; and

(5) would affect the environment, compared to the environmental impacts of alternatives, including—

(A) railroad transportation;

(B) alternative pipeline routes; and

(C) coal utilization facilities, including electric generating plants at coal mine sites and coal gasification plants.

(c) SMALL AND INDEPENDENT COAL PRODUCER ACCESS.—(1) For purposes of protecting small and independent coal producers, the Secretary shall require, as a condition of his determination under subsection (a), that the applicant, prior to application, shall offer to make available to such producers the lesser of—

(A) 10 per centum of the total pipeline capacity of the proposed interstate coal pipeline distribution system; or

(B) that portion of the total capacity necessary to satisfy the total interstate coal pipeline distribution system transportation demand of all such small and independent producers located in the geographic region (as determined by the Secretary) served by such pipeline;

under the same terms and conditions as other contracting entities.

(2) For purposes of this subsection, the term "small and independent coal producer" means a coal producer, or a broker or cooperative that represents individual coal producers—

(A) who produced two hundred thousand tons or less of coal during the calendar year preceding the calendar year in which the application is filed, and

(B) are not affiliated with any other company. For purposes of this subparagraph, a coal producer shall be treated as affiliated with another company if such company controls, is controlled by, or is under common control with such coal producer. The term "control" shall have the same meaning as provided by section 10102 of title 49, United States Code.

(d) PROCEDURES.—(1) Any decision under subsection (a) shall be made after notice and opportunity for presentation of written data, views, or arguments in accordance with section 553 of title 5 of the United States Code. If the Secretary, in his discretion, decides to hold hearings, the Secretary shall expedite such hearings and proceedings, and shall schedule all hearings, proposed findings and conclusions, exceptions and any recommended decisions so that the Secretary's final decision under this section shall be issued and completed within eighteen months from the date of receipt of a complete application, except that the Secretary may, for good cause, extend such eighteen-month period for additional periods of not more than ninety days.

(2) Within thirty days after receipt of an application for a determination under this section, the Secretary shall determine whether the application contains all of the information required for its consideration whereupon he shall, within seven days, publish notice of receipt of the application in the Federal Register. The Secretary shall further notify the Governor of each State in which the interstate coal pipeline distribution system will be located. Each notification shall identify the lands over which the interstate coal pipeline distribution system is to be constructed or operated and the water source to be used. If the Secretary determines that all of the required information is not in the application, he shall immediately notify the applicant of all the deficiencies in the application and provide a reasonable period of time for such applicant to provide additional information.

(3) Each applicant for such a determination shall reimburse the Secretary for administrative and other costs incurred by the Secretary in processing the application in such manner as the Secretary shall, by rule, prescribe.

(e) ANTITRUST REVIEW.—(1) Not later than ten days after any application for a determination under this section is received by the Secretary, the Secretary shall notify the Attorney General of the filing of such application and shall provide the Attorney General with a copy of such application and such other information as the Attorney General may request. The Attorney General shall conduct an antitrust review to determine the likely effects upon competition of approval of such application, and not later than one hundred and twenty days after the date of receipt of such notification shall advise the Secretary of the results of such review, including, but not limited to, findings, and recommendations concerning such terms and conditions as the Attorney General deems necessary to protect and promote competition. No application may be determined to be in the national interest under this section if the Attorney General advises the Secretary in writing that, on the basis of such review, approval of such application is not consistent with the antitrust laws.

(2) For the purpose of paragraph (1), the term—

(A) "antitrust laws" has the meaning such term has under section 1 of the Clayton Act (15 U.S.C. 12); and

(B) "antitrust review" has the meaning the term "antitrust investigation" has under section 2 of the Antitrust Civil Process Act (15 U.S.C. 1311).

(f) EMINENT DOMAIN AUTHORITY.—(1) Any person proposing to build an interstate coal pipeline distribution system, the construction of which has been determined by the Secretary to be in the national interest, may, after making good faith efforts to acquire, such rights-of-way by negotiations between such person and private landowners, acquire rights-of-way over, under, upon, or through private lands by exercise of the power of eminent domain in the United States district court for the district in which such lands are located or in the appropriate court of the State in which such lands are located. In any action or proceeding to acquire rights-of-way under this section, such action or proceeding shall conform to the laws, practices, and procedures relating to the general eminent domain law of the State where the property is situated, except that in the case of any such State law, practice, or procedure, the effect of which would prohibit any acquisition under this section, or which discriminates against interstate coal pipeline distribution systems, such State law, practice, or procedure shall not be applicable.

(2) Nothing in this section shall be construed to permit any person to acquire any water right through the exercise of the power of eminent domain granted under this Act.

(3) No interstate coal pipeline distribution system constructed pursuant to the authorities of this section shall be considered to be a Federal project for purposes of the application for or assignment of water rights.

(4) Unless there is no feasible and prudent alternative to the acquisition of a right-of-way and reasonable planning is made to minimize harm resulting from the acquisition, no

such right-of-way may be acquired through exercise of the power of eminent domain under this Act if such right-of-way is over, under, upon, or through—

(A) lands of National, State, or local historic significance as determined by the Federal, State, or local officials having jurisdiction thereof; or

(B) lands held by a qualified organization as defined in section 170(h)(3) of the Internal Revenue Service Code of 1954 primarily for wildlife refuge, sanctuary, recreational or natural resource conservation purposes.

(g) ALTERNATIVE ROUTES.—(1) Nothing in this section shall be deemed to prohibit the applicant from amending his application to request a right-of-way over any alternative route.

(2) The Secretary may require the relocation of any right-of-way sought pursuant to this Act upon a showing that—

(A) such relocation is necessary to enable the United States to realize fully the value of its mineral interest;

(B) such alternative route is available; and

(C) such relocation would not result in unreasonable expense.

(h) Payment for Federal Coal.—(1) Each application for a determination of national interest filed pursuant to subsection (a) shall list each instance where the proposed right-of-way crosses lands wherein the United States maintains a mineral interest regarding coal (hereinafter referred to as "Federal coal"). Not later than ten days after any such application is received by the Secretary, the Secretary shall notify the Secretary of the Interior of the filing of such application and shall provide the Secretary of the Interior with a copy of such application and such other information as the Secretary of the Interior may request.

(2)(A) The Secretary of the Interior shall evaluate the effects of approval of such application upon the ability of the United States to realize the value of such mineral interest as a result of approval of the application.

(B) The Secretary of the Interior shall—

(i) establish terms and conditions necessary to minimize the impact of such right-of-way on the establishment of logical mining units; and

(ii) determine the extent to which alternative routes are available which would minimize the impact of granting the right-of-way on the ability of the Federal Government to realize the value of Federal coal.

(C) The Secretary of the Interior shall establish the fair market value of the Federal coal precluded from being recovered as a result of the proposed right-of-way. The Secretary of the Interior shall also establish the amount of reduction of the fair market value of Federal coal which will be more costly to recover as a result of the proposed right-of-way.

(3) The Secretary shall thereafter establish such terms and conditions requiring the applicant to pay the United States the amount established by the Secretary of the Interior pursuant to subparagraph (C).

(i) RULES AND REGULATIONS.—The Secretary shall promulgate such rules and regulations as are necessary for the expenditious exercise of the authority granted in this section.

(j) ADDITIONAL REQUIREMENT.—In implementing this section, the Secretary shall be subject to the provisions of section 210 of Public Law 90–537, as amended (43 U.S.C. 1511).

PRIMACY OF STATE WATER LAW

SEC. 5. (a) No person, legal entity, or governmental entity (including the United States, a State or subdivision thereof), their agents, permittees, licensees, or transferees, or any interstate coal pipeline distribution system, shall control, reserve, appropriate, purchase, transfer, use, divert, dedicate, dispose of, distribute, acquire, exercise, export or claim water, or any right or interest therein, for export or use within or outside the State granting or denying the export or use of water in an interstate coal pipeline distribution system, unless such control, reservation, appropriation, purchase, transfer, use, diversion, dedication, disposal, distribution, acquisition, exercise, export or claim takes place pursuant to and in compliance with the State water law of that State. Such State water law shall be enforced even though enforcement would result in the failure to build an interstate coal pipeline distribution system, and even though it would result in uneven and disparate effects on interstate commerce.

(b) In full recognition of its powers under Article I, section 8, of the United States Constitution, Congress expressly delegates to the States the power to regulate the use or export of water in interstate coal pipeline distribution system, through State water laws, notwithstanding any adverse impact such delegation may have on interstate commerce or on any interstate coal pipeline distribution system. This delegation expressly includes but is not limited to provisions of State water law which provide for the establishment or exercise of terms or conditions (including terms or conditions terminating use or relating to or prohibiting the export of water) on permits or authorizations for, interests in, or rights to control, reservation, appropriation, purchase, transfer, use, diversion, dedication, disposal, distribution, acquisition, exercise, export or claim of water for the export or use in any interstate coal pipeline distribution system.

(c) Nothing in this Act shall—

(1) impair the validity of or preempt any provision of State water law, or of any interstate compact governing water;

(2) alter the rights of any State to its apportioned share of the waters of any body of surface or groundwater, whether determined by past or future interstate compacts, or by past or future legislative or final judicial allocations;

(3) preempt or modify any State or Federal law or interstate compact dealing with water quality or disposal;

(4) confer upon any non-Federal entity the ability to exercise any Federal right to the waters of any stream or to any ground water resources; or

(5) affect water rights of any Indian or Indian tribe which were established by the setting aside of a reservation by treaty, executive order, agreement or Act of the Congress.

(d) No waters to which a Federal right can be asserted shall be used or exported in any interstate coal pipeline distribution system, unless authorized pursuant to and subject to State water law in the same manner as provided for in subsection (a).

APPLICATION OF STATE AND LOCAL LAWS OTHER THAN STATE WATER LAW

SEC. 6. With respect to any State or local law other than State water law, nothing in this Act shall impair the validity of or preempt such State or local law, regulation, or rule of law pertaining to the location, construction, operation, or maintenance of an interstate coal pipeline distribution system except where such State or local law, regulation, or rule of law discriminates against interstate coal pipeline distribution systems.

UNDERGROUND CONSTRUCTION

SEC. 7. All coal pipelines granted Federal powers of eminent domain, pursuant to the provisions of this Act, for rights-of-way and extensions thereof shall, to the maximum extent practicable, consistent with environmental protection, safety, and good engineering and technological practices, be located underground, and the person holding such right of Federal eminent domain shall replace sufficient topsoil on disturbed areas so that a vegetative cover, comprised of native species where practicable, can be reestablished at least equal in extent of cover as that which sustained the natural vegetation in the area.

CONTINUING JURISDICTION OF STATE PUBLIC UTILITY COMMISSIONS

SEC. 8. Nothing in this Act shall be construed to require any forms of automatic passthrough of, or preempt the ratemaking authority of any State utility regulatory agency or the Federal Energy Regulatory Commission with respect to costs related to construction, operation, and maintenance of any interstate coal pipeline distribution system, whether or not such costs have been provided for by contract between a utility and the interstate coal pipeline distribution system operator.

APPLICABILITY OF ENVIRONMENTAL CONTROL LAWS

SEC. 9. Any interstate coal pipeline distribution system authorized under this Act shall be subject to the requirements of the Federal Water Pollution Control Act, as amended (33 U.S.C. 466 et seq.), and any other applicable Federal environmental control laws.

WATER DISCHARGE REQUIREMENTS

SEC. 10. Prior to the issuance of any findings pursuant to section 4 of this Act, the Secretary shall notify the Administrator of the Environmental Protection Agency of his consideration of the application for a determination under subsection (4)(a). The Secretary and the person applying for such determination shall provide such information as the Administrator shall require to conduct a review of the ability of the proposed interstate coal pipeline distribution system to comply with Federal water discharge requirements. The Administrator shall have one hundred and twenty days from the date of receipt of such notification to conduct such review and to advise the Secretary with respect thereto. The Secretary shall not issue any findings pursuant to section 4 unless he has received a report from the Administrator of the Environmental Protection Agency advising that, in the judgment of the Administrator, it can reasonably be expected that the water discharge can meet the requirements of the Federal Water Pollution Control Act.

ACCESS TO COAL PIPELINE TRANSPORTATION CONTRACTS

SEC. 11. (a)(1) By filing a contract between a prospective shipper and a pipeline carrier with the Federal Energy Regulatory Commission (hereinafter referred to as the Commission), within ten business days of signing said contract, any person operating or proposing to operate an interstate coal pipeline distribution system may enter into contracts with one or more shippers of coal to provide transportation under specified rates, terms, and conditions but may not unreasonably discriminate by refusing to enter into similar contracts under similar rates, terms, and conditions with other shippers who are seeking service from the same origin areas to the same terminus areas and are ready, fit, willing, and able to enter into such contracts in a contemporaneous period. The term "ready, fit, willing, and able" as used in this section includes, but is not limited to financial fitness. Such contract filing shall include all rates, terms, and conditions of said contract.

(2) Service under a contract executed pursuant to paragraph (1) of this subsection is deemed to be a separate and

distinct class of service. Persons operating interstate coal pipeline distribution systems shall be obligated to perform only those duties specified by the terms and conditions of any such contract in connection with the services provided under such contract. Service under such contracts shall not be interrupted for the purpose of prorating or allocating to other shippers the pipeline capacity committed to service under such contracts.

(b)(1) Any person operating or proposing to operate an interstate coal pipeline distribution system who files contracts under this section for the transportation of a volume of coal which is less than the volume of coal that would totally obligate the capacity of the pipeline shall, in the sixty-day period beginning on the date of the filing of such contract, enter into contracts with shippers who are ready, fit, willing, and able to enter into such contracts under rates, terms, and conditions similar to the rates, terms, and conditions contained in the contract that has been so filed. That person shall enter into such similar contracts in the chronological order in which binding written offers to enter into such similar contracts are submitted to such person. The obligation imposed by this subsection shall remain in effect—

(A) until the capacity of the pipeline is totally committed for providing transportation under contracts approved under this section, or

(B) until the end of the sixty-day period, whichever occurs first.

(2) Not later than the thirtieth day following the end of such sixty-day period, a shipper of coal may file a complaint with the Commission on the grounds that the person operating the interstate coal pipeline distribution system is violating this subsection.

(3) If, following a notice and an opportunity for a hearing, but not later than the thirtieth day following the filing of a complaint in accordance with paragraph (2) of this subsection, the Commission finds that the person is violating this subsection and has, with respect to the complaining shipper, an obligation under this subsection to enter into a contract, the Commission shall order that person to provide the service specified in the offer under such rates, terms, and conditions contained in the contract that is filed with the Commission under paragraph (1) of this subsection. In addition, if the Commission finds that a person is violating this subsection by entering into contracts with shippers of coal pursuant to paragraph (1) of this subsection in an order other than the order in which binding offers are submitted, the Commission shall establish the proper order of such for approval under subsection (c) of this section.

(4) The Commission may not approve, under this section, any contract for the transportation of coal by pipeline—

(A) if approval of such contract will result in the total tonnage of coal obligated to be transported by the pipeline in any period under contracts approved under this section exceeding the maximum capacity of the pipeline in such period; or

(B) if the provision of coal transportation services under such contract would result in a destructive competitive practice.

The **Chairman**. I anticipate today's testimony to reinforce the fact that coal slurry pipelines will provide great benefits to our country in terms of reduced reliance on foreign energy sources, greater ability to compete in the world export market and creation of thousands of jobs.

I thank our distinguished witnesses for being here today. I look forward to hearing from them, and before we do, I would like to call on my distinguished colleague from Kentucky, Senator Ford, who has a passing interest in coal and is a great expert in this field, and who otherwise is a very good, capable and wonderful person. Senator Ford? As long as he votes right. [Laughter.]

Senator **Ford**. I have let you down very few times, Mr. Chairman. In fact, I voted with you when you only had two votes. [Laughter.]

The **Chairman**. Senator Ford, you voted with me when I was wrong, and that's when I really appreciate it. [Laughter.]

Senator **Ford**. I anticipated you being chairman. [Laughter.]

I say to my distinguished and fine colleague that I will forgo my opening statement today because I made it—and if you want to refer to it—during the 98th Congress.

The **Chairman**. Senator Bingaman, I have nice things to say about you too.

Senator **Bingaman**. I am just here to learn, Mr. Chairman. I have no opening statement.

The **Chairman**. Thank you very much.

Our first panel will be composed of Dr. Irving Leibson, executive consultant of Bechtel Group, Inc., representing the Slurry Technology Association, along with Marvin Boede, general president of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, representing the Building and Construction Trades Department of the AFL–CIO.

Gentlemen, please come forward and proceed as you will. We prefer that you summarize, but we will not insist upon that if you would like to read.

STATEMENT OF DR. IRVING LEIBSON, CHAIRMAN, COAL AND SLURRY TECHNOLOGY ASSOCIATION

Dr. **Leibson**. Thank you, Senator Johnston.

Mr. Chairman and members of the committee, I better set one thing straight before we start. You addressed me as Dr. Leibson. For the record, I would like to make it clear that I am not a medical doctor. I have a doctorate in chemical engineering from Carnegie Tech and Carnegie Mellon University, and I just did not know when to stop going to school.

I was president of the American Institute of Chemical Engineers in 1974, and am currently chairman of the Council on Alternate Fuels, a charter member of the National Coal Council, and was chairman of its Clean Coal Technology Work Group last year, and have recently been appointed chairman of its Coal Policy Committee and a member of its Executive Committee.

I am here today in my capacity as chairman of the Slurry Technology Association. This association, headquartered in Washington, DC, includes domestic and foreign companies and individuals interested in the development and application of slurry technologies to pipeline transport, industrial processes and fuel use. Of principal interest to our membership are coal slurry technologies.

Together with the Department of Energy, our association cosponsors an annual international technical conference on coal and slurry technologies. These technologies include the processing of coal to transform it from a bulk, unclean material into a uniform clean slurry usable as a fuel at the mine site or for long distance transport through a pipeline.

I appreciate the opportunity to appear before you today.

One coal slurry pipeline is currently operating in the United States, moving interstate 5 million tons per year of coal from Black Mesa in Arizona to a powerplant about 273 miles away in Nevada. This pipeline, which has been operating for 17 years, is owned by a subsidiary of the Southern Pacific Railroad.

Coal slurry transport over long distances in large volumes through pipelines is very cost-competitive when compared to rail transport. Opposition of the railroads to coal slurry pipelines has been intense. Yet, competition in coal transportation in a free market on a fair basis is vital to the economic strength of the country.

It is of great importance that Federal eminent domain as embodied in S. 801 and H.R. 1531 be granted to coal slurry pipelines to facilitate the development and construction of coal slurry pipeline projects in the United States. The use of litigation to secure rights-of-way for coal slurry pipelines is extremely costly and time consuming. For coal pipelines in the areas of the Nation served by nonland grant railroads, not even this approach is possible because the railroads own the underlying land in fee simple.

The right of Federal eminent domain was granted to interstate natural gas pipelines in 1947, to interstate petroleum and petroleum product pipelines in 1941. The grant of Federal eminent domain authority to the land grant railroads, Santa Fe, Union Pacific, and Burlington Northern, was given in the 1860's.

Interstate slurry pipelines can be developed and built without any Federal financial assistance. Federal right of eminent domain legislation, however, is needed to facilitate these projects.

My detailed testimony, which is submitted for the record, includes an address I delivered at the 12th International Slurry Conference in New Orleans, LA, on April 1, 1987, which sets forth the historical development of slurry pipeline technology and projects worldwide.

The detailed testimony also addresses the legislative impacts of S. 801 and H.R. 1531 on various national interest issues and is covered in my prepared statement for the committee.

Together these two documents include the following conclusions. First, long distance slurry pipelines for transporting minerals of various types have been thoroughly demonstrated on a commercial basis. During the past 25 years a total of 27 long distance slurry pipelines have been constructed with a combined length of more than 1,700 miles and a total throughput of more than 60 million tons.

Second, coal water slurry mixture and fuel preparation is an important component of clean coal technology developments which can substantially reduce sulfur emissions by reducing the sulfur content of the coal used in steam and electricity generation in combination with other approaches.

Third, coal pipeline transport will provide a competitive alternative to coal rail rates as demonstrated by the operating history of the Cadiz pipeline and the still operating Black Mesa pipeline, and as projected recently by the Federal Information Administration—Energy Information Administration in their report titled "Coal Slurry Pipelines—Impact on Coal Markets."

Fourth, consumers will benefit economically from the competition provided by coal slurry pipelines by stimulating rail carriers to increase efficiency and to price their services more reasonably as demonstrated by the history of the Cadiz pipeline in Ohio and more recently by the competitive bidding between the ETSI pipeline project and two western railroads for a coal supply contract with Arkansas Power and Light.

Fifth, long-term contracts now about 60 percent of the rail coal market protect the railroads from massive, sudden losses of market to competitors. And the long engineering permitting and construction time, typically about 5 years, required by a coal pipeline provides time for market adjustments to occur.

Sixth, the long-run demand for coal will provide a large net increase in business for the railroads over and above whatever is taken away by coal pipelines supporting the Energy Information Administration's conclusion that coal pipeline competition would still allow substantial growth in railroad coal revenues and railroad ton miles. Indeed, the railroads really ought to consider becoming equity owners of coal slurry pipelines.

Seventh, the development of coal slurry mixtures and fuels can provide us an affordable source——

The CHAIRMAN. Would you pull the microphone up a bit, Doctor? They cannot hear you in the back of the room.

Dr. LEIBSON. Yes, sir.

With an affordable source of quality energy replacing our present dependence on dwindling non-Persian Gulf oil thereby providing an important margin of safety against our increasing dependency on Persian Gulf oil.

Eighth, rate and quality competition by coal pipelines will lower high inland rail rates now seriously hindering the efforts of U.S. coal producers to hold and increase their share of the international market.

Ninth, S. 801 and H.R. 1531 protect a State's water rights and water use. Under the legislation Federal eminent domain authority may not be used to acquire any right to take, use, dispose or develop water. Pipeline companies understand that they are required to carry the burden of demonstrating the existence of both physically and legally adequate water supplies.

Tenth, Federal eminent domain legislation is needed. State legislatures are highly abbreviated sessions. The window approach utilizing litigation for rights-of-way tried by ETSI is not practical as a business approach in developing coal pipeline projects. In other areas of the Nation this approach is impossible because the railroads own the underlying land in fee simple, and they refuse to negotiate. Uncertainties in project timing and execution created by being unable to tie down rights-of-way make it exceeding difficult to obtain binding commitments in marketing the coal to users.

Mr. Chairman and members of the committee, the case for interstate for coal slurry pipelines is compelling. Interstate coal slurry pipelines will provide significant energy and consumer benefits for the Nation. But the development of these interstate systems needs to be facilitated by workable Federal eminent domain legislation such as S. 801 and H.R. 1531.

We urge the enactment of this legislation expeditiously in order that the benefits of long distance coal pipelines can be realized by the Nation.

My compatriot, Marvin Boede, I am sure will comment on the potential favorable impact on the economy in terms of jobs that these projects will create.

[The prepared statement of Dr. Leibson follows:]

STATEMENT OF

IRVING LEIBSON

CHAIRMAN, COAL AND SLURRY TECHNOLOGY ASSOCIATION

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES

U. S. SENATE

S. 801, THE COAL DISTRIBUTION AND UTILIZATION ACT OF 1987

SEPTEMBER 10, 1987

Introductory Statement

Mr. Chairman and members of the Committee, I am Irving Leibson, Chairman of the Coal and Slurry Technology Association. This association, headquartered in Washington, D.C., includes domestic and foreign companies and individuals interested in the development and application of slurry technologies to pipeline transport, industrial processes, and fuel use.

Of principal interest to our membership are coal slurry technologies. Together with the Department of Energy, our association co-sponsors an annual international technical conference on coal and slurry technologies. These technologies include the processing of coal to transform it from a bulk, unclean material into a uniform clean slurry usable as a fuel at the mine site or for long distance transport through a pipeline.

One coal slurry pipeline is currently operating in the United States moving intrastate 5 million tons per year of coal from Black Mesa in Arizona to a power plant 273 miles away. This pipeline which has been operating for 17 years, is owned by a subsidiary of the Southern Pacific Railroad.

Coal slurry transport over long distances in large volumes through pipelines is very cost competitive when compared to rail transport. Opposition of the railroads to coal slurry pipelines has been intense. Yet, competition in coal transportation in a free market on a fair basis is vital to the economic strength of the country.

It is of great importance that federal eminent domain (as embodied in S. 801 and H.R. 1531) be granted to coal slurry pipelines to facilitate the development and construction of coal slurry pipeline projects in the United States. The use of litigation to secure rights-of-ways for coal slurry pipelines is extremely costly and time consuming. For coal pipelines in areas of the nation served by non-landgrant railroads, not even this approach is possible because the railroads own the underlying land in fee simple.

The right of federal eminent domain was granted to interstate natural gas pipelines in 1947, and to interstate petroleum and petroleum product pipelines in 1941. The grant of federal eminent domain authority to the land grant railroads (Santa Fe, Union Pacific, and Burlington Northern) was given in the 1860's.

Interstate slurry pipelines can be developed and built without any federal financial assistance. Federal right of eminent domain legislation is needed to facilitate these projects. My detailed testimony, which is submitted for the record, sets forth:

(1) the details of the technology involved;
(2) how the competition provided by coal slurry pipelines will benefit coal consumers economically;

(3) how coal pipeline transport will provide a competitive alternative to coal rail rates;

(4) the impact of pipeline competition on the railroads and railroad workers ;

(5) the importance of coal pipelines in protecting our energy security;

(6) how coal pipelines will assist U.S. steam coal to compete abroad;

(7) the legislative protection of water rights and water use;

(8) the precedent and need for federal eminent domain legislation; and

(9) background information concerning the historical development of slurry projects worldwide as covered in an address I gave to the Twelfth International Slurry Conference in New Orleans, Louisiana, on April, 1, 1987.

In closing, I urge you to support the passage of federal eminent domain legislation for coal slurry pipelines (as embodied in S. 801 and H.R. 1531) in the national interest. I appreciate the opportunity to appear before you today.

(1) The Technology Background

The commitment to long-distance coal slurry preparation and pipeline transport began over 30 years ago and moved over the commercial threshold in the late 1950's. Since then, two pipelines -- Cadiz (1957) an intrastate pipeline and Black Mesa (1970) which is essentially an intrastate pipeline since 99+% of the pipeline is in Arizona -- have been built to carry mixtures of pulverized coal and water from mines to domestic power plants. These projects spurred by two energy crises, have led to accelerated improvements in materials handling, advanced fuel mixtures, and new coal cleaning technology associated with slurry preparation and pipeline transport.

The two long-distance coal pipelines that have operated in the United States have carried equal mixtures (by weight) of pulverized coal and water. However, water is not the only medium which can be used for transportation. Various companies and researchers have considered using methanol, liquified carbon dioxide and petroleum fractions. In at least one proposed pipeline project, the carbon dioxide, after separation, is expected to be used in tertiary oil recovery processes.

Even where water is the medium, conventional 50-50 mixtures of coal and water may not be the only mixes that can be transported. A 70% coal 30% water slurry is to be used in a 4 million ton per year 162 mile long pipeline being built by the USSR in Siberia. The Russians expect to burn the slurry directly in boilers for electricity generation without the need to remove any water prior to combustion. Further details of the technologies involved are given in my paper entitled: "Overview Address" presented at the Twelfth International Slurry Technology Conference of the Coal and Slurry Technology Association, April 1, 1987, in New Orleans, Louisiana.

(2) The Competition Provided by Coal Slurry Pipelines Will Benefit Consumers Economically

Full use of America's abundant coal reserves requires efficient, reasonably priced transportation services. Railroads now carry about two out of every three tons of coal produced in the United States to utility and industrial plants and to ports engaged in shipping America's coal to export market. Railroads are able to exert great market power over these coal routes because much of the coal transported by rail is captive to a single rail carrier for most, or all, of the movement from mine to destination.

Because of this, rates charged by the carriers often are unreasonably high, a circumstance that can be remedied by enabling coal pipelines to compete with railroads for coal shipments. Market forces resulting from competition will stimulate carriers to increase efficiency and to price their services more reasonably.

A successful long-distance intrastate coal pipeline in Ohio (Cadiz), which carried 1 1/4 million tons per year of coal in coal slurry form reliably to Cleveland Electric Illuminating Company's (CEI) Eastlake plant at a rate that was one-third less than the per ton rail cost (about $2.00 versus $3.50), was mothballed after six years of operation. The five railroads which supplied 5 millions tons per year of coal to all of CEI's plants offered to cut their rates by about $1 per ton when they learned of plans by Texas Eastern and Consolidation Coal Company to construct a 12MM ton per year coal slurry pipeline to serve the West Virginia, New Jersey, New York areas. The condition imposed for granting of the reduced freight rate was that the Cadiz line be shut down. In addition, the railroads proposed to haul the utility's coal on more efficient dedicated "unit trains," not multi-commodity trains as before.

A more recent event demonstrates the impact on rail rates of further potential competition from slurry pipelines. Chicago North Western Transportation Company and Union Pacific slashed their rates to underbid the ETSI pipeline project in contract negotiations with Arkansas Power & Light Company, to move 11 million tons per year of coal. This contract will result in a $16.4 billion savings to Arkansas electricity consumers over a 20 year period.

Transportation rates paid by utilities now account for about one-third of the delivered price of coal on the average, and often amount to one-half or more of coal's delivered price. For some rural electric cooperative systems, the expense of coal transportation is second only to the cost of power plant financing.

It would be ideal if rail rates could be assessed on the basis of rail costs. Rail costs, however, are not available. Nevertheless, the Bureau of Labor Statistics (BLS) price indices serve as a good indicator of the cushion that market dominance has provided the railroads. According to the BLS, the price index for all rail freight shipment rates increased from a base of 100.0 in 1969 to 374.2 in 1985. That means that goods that cost $100 to ship 16 years ago now cost $374.20. The rail coal freight index rose even faster, from 100.0 in 1969 to 403.20 in 1985. By contrast, the BLS producer price index for all commodities rose to 308.7, almost 100 points below the increase in rail coal freight rates for the same period.

(3) Coal Pipeline Transport Will Provide a Competitive Alternative to Coal Rail Rates

There is no comparable BLS index for coal slurry pipeline rates, but there are good general measures for assessing rail and pipeline costs. Historically, coal pipelines have proven to be cost effective and reliable modes of transporting domestic coal in two basically intrastate systems in Ohio and Arizona.

The Cadiz pipeline, mentioned earlier, which carried about one-fourth of the coal required by the utility, did so at a very competitive rate -- $2.00 per ton compared to $3.50 per ton charged by the railroads for the remainder of the coal required by the Cleveland utility. The Black Mesa Pipeline -- built and operated by an affiliate of the Southern Pacific Railroad in 1970 -- is delivering coal today, efficiently, reliably and at an extremely competitive rate after 17 years of operation. The pipeline was built by the railroad subsidiary because the cost of building a railroad line across the rugged terrain in that part of Arizona was prohibitive.

The economics of proposed coal pipeline systems appears to have withstood the test of a recent assessment by the Energy Information Administration (EIA) published in 1985 (_Coal Slurry Pipelines: Impact on Coal Markets_, Energy Information Administration, (DOE/EIA-0468), April 1985). The rate evaluation by the energy agency was undertaken for the following representative segments of proposed routes for four pipelines: ETSI (Wyoming to Texas); Allen-Warner (Utah to Nevada); Coalstream (West Virginia to North Florida); and Virginia (Virginia to Virginia). Under their standard rate/medium demand case, the report found that by 1995, the near mid point of the assumed 25-year lifespan of the projects, the four pipeline systems could carry a conventional mixture of pulverized coal and water from mines to power plants $12 to $20 per ton more cheaply than rail systems.

(4) The Impact of Pipeline Competition on the Railroads and Railroad Workers

For the foreseeable future, the vast majority of domestic coal shipments will be made by rail. What has prompted the railroads to strenuously oppose coal pipelines is their belief that this alternative transport mode will take from them some significant portion of their coal hauling traffic. This argument has been the cornerstone of railroad and rail labor lobbying with Congress.

The railroads contend that coal pipelines will lead to a dramatic drop in railroad revenues and massive railroad employee job loss. Notwithstanding that Association of American Railroads statistics show that railroad employment in Class I railroads has declined by 264,403 since 1970 -- a period when no coal pipelines were built -- it is alleged that coal pipelines will syphon off coal hauling traffic, creating earnings problems for the railroads.

This allegation is without merit. Sixty percent of the market the railroads now enjoy is under long-term contracts, protecting them from any massive, sudden loss of the market from competitors. Moreover, because no pipelines could be engineered, permitted and constructed in less that five years, railroads would have a long lead time in which to transition their systems and develop additional business. Furthermore, coal production is projected to rise to over 1.1 billion tons of coal by the mid-1990's. This will provide a large net increase in business for the railroads over and above whatever is taken away by coal pipelines.

If the four pipelines estimated by EIA in their study had gone into operation by 1995, they would carry about 47 million tons of coal each year. This leaves a rounded 1 billion tons annually to be carried by existing coal transportation.

Because railroads would continue to haul the bulk of coal, EIA found that should the four pipelines be built and operate at the agency's projected rates, railroad revenues would not be adversely affected and coal users would benefit:

> ". . .Railroad revenues from coal carriage would still be almost 60 percent higher and railroad ton-miles nearly 30 percent higher in 1995 than in 1984. . ." and "Coal users could realize savings of between $200 million and $1 billion in 1995. . ."

The railroads have disputed this conclusion drawn by EIA on the basis that railroad coal revenues between 1984 and 1986 have declined, in part due to a drop in tonnage. While the 1984 to 1986 decline is a measure of short-run conditions, it is not representative of what government analysts expect to happen long term. While the Department of Energy has revised its projections of coal production downward slightly recently, the revisions do not alter the long-run trend significantly.

The 1.1 billion tons of coal production currently projected by DOE is still 230 million tons more than in 1984, the base year of the EIA study. For the period in question, this current projection yields production growth rate of coal than is only 0.5 percent, 2.0 percent, and 1.0 percent lower than EIA assumed for coal produced east of the Mississippi River, west of the Mississippi river, and in the total U.S., respectively. Relatively low oil and natural gas prices are not expected to dampen demand for coal by electric utilities, which will rise by more than 200 million tons between 1984 and 1995. And although the overall market for coal in the industrial sector will remain relatively small, recent sales of fluidized bed, coal-fired boilers suggest that industrial demand will rise to 109 million tons by the year 2000, reversing the decline and uncertainty experienced in the industrial market for coal over the past two and a half decades.

We conclude that the long-run demand for coal continues to be strong enough to support EIA's estimate that the shift of 47 million tons of coal from rail to pipelines would still allow substantial growth in railroad coal revenues. The short-run decline often noted by the railroads is over. According to a July 7, 1987 article in the Journal of Commerce, it is not only over, railroad recovery is ahead of schedule, as the article title

"Rail Freight Traffic Ahead of Forecasts" suggests.

(5) The Importance of Coal Pipeline in Protecting our Energy Security

It is hard to watch the turmoil in the Persian Gulf today without remembering the havoc during the last decade due to reliance on foreign oil. Of course, our position today is stronger than in the early 1970's, primarily due to new oil supplies from Mexico, the North Sea and developing countries, resulting from the short-run at least in less dependence on Middle East sources of oil supplies.

But while we have diversified out reliance on foreign oil, total U.S. dependence on oil imports is greater than during the Arab oil embargo of the 1970's. As reported recently in The Wall Street Journal, "America's sobering dependence on foreign oil was dramatized in the last week of July when, for only the second time in history, its petroleum imports exceeded its crude-oil production" (August 21, 1987).

The Department of Energy expects crude oil and petroleum product imports to increase from 32.1 percent of demand in 1986 to 49.9 percent in 1995 and 56.2 percent by the end of the century. So long as there is excess capacity in non-Persian Gulf reserves, these countries can meet our needs. But these needs have to be measured against the production of these countries 5 or 10 years from now.

Looking at the problem as it stretches out for the rest of this century, modest economic growth is expected to raise oil consumption, while non-Persian Gulf reserves will be depleted and production will fall. Under this scenario, dependence on Mideast oil would rise.

With Middle East strife escalating and growing economic instability in Latin America, the United States must have as a cornerstone of its energy policy a lessening of its dependence on foreign fuel supplies, and beyond this, developing the resources we have as a stable source of energy for ourselves and our allies. Among the more important margins of safety are the development of alternative coal mixtures and fuels to replace dependency on both non-Persian Gulf and Persian Gulf oil in industrial and power applications.

(6) How Coal Pipelines Will Assist U.S. Steam Coal to Compete Abroad

A central aspect of our foreign policy is to assist industrialized nations in their attempts to reduce their dependence on Middle Eastern crude oil. U.S. coal is the key to our ability to influence the international energy supply patterns.

Following the two international crude oil supply interruptions of the 1970's, the industrialized nations of western Europe and the Pacific Rim began a process of diversifying their primary sources of fuel for steam generation away from Middle Eastern crude oil. As a result, the United States was able to increase its steam coal exports from 14 million tons in 1979 to 45 million tons by 1981. Forecasts for U.S. exports were bullish, predicting up to 200 millions tons of exports by the year 2000. Meanwhile, other energy resources were also competing for this new market, including Soviet natural gas and coal from Canada, China, Poland, South Africa, Australia, and most recently, Colombia.

By 1982, the U.S. role in coal exports began to diminish and the long-term outlook for our coal exports were down 21 million tons, cutting the 1981 total essentially in half. This represented a decline in terms of both market share and absolute tonnage while world coal exports were increasing dramatically in response to the expansion in world coal demand during the 1980 to 1984 period. Competing aggressivly for this new market, Australia, South Africa and Poland increased their share, surpassing the U.S. in steam coal exports (Outlook for U.S. Coal Imports -- DOE/EIA-0483 -- pp. vii and 9).

DOE expects world steam coal trade to continue to expand, from 163 million short tons in 1984 to 225 million in 1990, a 38 percent increase. However, U.S. exports are expected to gain only 5 milion short tons out of the 62 million short ton increase, resulting in another drop in world market share from 16 percent in 1984 to 13.8 percent in 1990. Unless turned around, U.S. competitors will be the clear winners, increasing their coal exports by 42 percent as well as gaining 86.2 percent of the world market share (Annual Outlook for U.S. Coal, 1986 -- DOE/EIA-0333,86 -- Table 7, p. 8).

There are, of course, numerous important factors that undermine the competitive postion of American coal producers in the international market today. Certainly, the strength of the dollar against certain foreign currencies is still among the most important of them. The bold search for foreign exchange by some international competitors, who directly and indirectly subsidize their coal sectors, is another. A third cause is the high U.S. inland rail rates charged for hauling coal by railroads.

The Ambassador of Italy was so concerned about high rail rates that he wrote U.S. Representatives in 1983 of his great interest in coal pipeline legislation, which he felt would introduce competition for coal transportation to the ports.

Appearing before a Maryland legislative committee hearing a state coal pipeline bill, a western Maryland producer testified in 1984 that the state's coal producing region was being locked out of the European market, citing the fact that it cost $14.65 per ton to ship coal from Cumberland, Maryland, to the port of Baltimore, compared to as low as $7.00 per ton from Baltimore to Europe.

These high rail rates seriously hinder the efforts of U.S. coal producers to hold and increase international share of market for U.S. coal.

(7) The Legislative Protection of Water Rights and Water Use

The most controversial aspect of interstate coal pipelines is the fact that most coal pipelines that are being considered today will use water as the medium of transportation. The allocation and use of water is an important issue in every region of our nation. The issue is of particular importance, obviously, in those regions of our nation where water is relatively scarce, such as certain areas of the west and southwest, and in those states where water may be potentially discharged.

(a) Legislation Protects a State's Right to Make Water Allocation Decisions

As proponents of coal pipelines, we strongly support Section 5 of S. 801 and Section 205 of H.R. 1531 which provide that decisions concerning the allocation and use of water shall be made pursuant to state substantive and procedural law. We support these provisions, which provide that federal eminent domain authority may not be used to acquire any right to take, use, dispose of, or develop water. This language was carefully crafted by Western senators and congressmen and water law experts who testified before congressional hearings and reflects their concerns.

Pipeline companies understand that they will be required to carry the burden of demonstrating the existence both physically and legally of adequate water supplies. They will have to prove that pipeline use of water can be made without injuring the rights or impairing the ability of state water agencies to plan and regulate the use of their water supplies.

States should be assured that the water provisions of S. 801 and H.R. 1531 will be effective. These (1) clarify that federal eminent domain authority may not be used to acquire water rights; (2) provide that those terms and conditions that a state includes in a water permit shall be enforceable despite the fact that the water moves in interstate commerce; (3) clarify that nothing in S. 801 and H.R. 1531 shall be construed to override or modify state water law or any provision of an interstate water compact; and (4) provide that all water allocated to an interstate coal pipeline that is determined to be in the national interest must be allocated pursuant to state substantive and procedural law.

(b) The Legislation Requires Federal, State and Local Standards for Water Discharge to Be Met

Coal-water fuels require no discharge of water because they are direct-fired into a boiler. To the extent water used in coal water slurry is discharged prior to combustion, it is subject to federal, state and local water pollution laws under the provisions of S. 801 and H.R. 1531. The Clean Water Act, formally called the Federal Water Pollution Control Act, establishes minimum quality standards and prohibits the discharge of any water which does not meet these standards. Before water can be discharged, permits must be obtained and permit holders must prove that all applicable standards will be met. The Act also authorizes the Administrator of the Environmental Protection Agency to delegate to states certain aspects of water pollution control. Consequently, states have enacted water pollution laws and established agencies to administer them.

(c) The Environmental Impact Statement on Water Discharge by ETSI

An example of the application of state and federal water pollution control law to the water used in coal pipelines is the ETSI Pipeline Project. A final Environment Impact Statement (EIS) was issued for the proposed pipeline, as required by the National Environmental Policy Act. It examined the environmental effects of discharging the water used in the slurry pipeline and concluded:

> (1) water discharged into freshwater stream or rivers will not have impacts on the beneficial uses of the streams or rivers;

(2) water discharge will not affect the aquatic biology because the discharge must meet applicable state water quality standards and National Pollutant Discharge Elimination System standards set by EPA;

(3) projected levels of metals after treatment of the water would be less than all EPA Primary Drinking Water Standards;

(4) water treatment facilities will reduce the levels of total dissolved solids and sulfates to state standard.

The costs of the facilities to treat water used in a coal pipeline in order to comply with state and federal water pollution control laws will be borne by the pipeline company, and are included in the construction costs. It is the conclusion of water disposal experts appearing before many international water conferences that while chemical interactions do occur beween water and coal under simulated conditions of coal pipelines, clean-up can be achieved with technological and economic ease. The variation of slurry water characteristics is consistent with variation in other industrial wastewaters and with municipal wastewaters and is recognized by personnel in the pollution control profession.

(8) The Precedent and Need for Federal Eminent Domain Legislation

Interstate coal pipelines can be built without Federal financial assistance. Interstate coal pipelines cannot, however, be built without long and costly litigation to secure rights-of-ways unless federal legislation is enacted to provide the federal right of eminent domain to interstate coal pipelines. Except for the special case of Black Mesa, no major interstate coal slurry pipelines have been built in this nation during the 25 years since federal eminent domain legislation was first submitted to Congress in 1962.

(a) State Eminent Domain

Faced with active railroad opposition, state legislatures have difficulty dealing effectively with the issue of eminent domain for coal pipelines in their usual abbreviated sessions, particularly when the fundamental issues of providing essential state services are today so difficult and time consuming.

These practical problems are especially relevant in those states through which pipelines must be built, but in which coal is neither picked up nor delivered. In fact, such states may encounter legal difficulties in identifying benefits to their citizens that would support the grant of state eminent domain authority to such coal pipelines. Similar experiences led to the amendment of the Natural Gas Act in 1947 to grant the Federal power of eminent domain to interstate gas pipelines.

(b) The ETSI Story

The experiences of the ETSI Pipeline Project paint a clear picture of the difficulties involved in building an interstate coal pipeline without federal eminent domain. ETSI's right-of-way acquisition for the 1386-mile main coal pipeline began in 1974. ETSI found that the greatest difficulty encountered was in securing permission to cross under the various east-west railroad routes which had to be crossed in the southeasterly pipeline routing. ETSI officials initiated contacts with the various railroads involved in an attempt to negotiate easements or licenses to cross under the track beds located across the proposed route. Ultimatly, the ETSI representatives were refused crossing permits in every instance.

Faced with railroad refusals to negotiate and federal requirements that preparation of an environmental impact statement could not be undertaken until ETSI had demonstrated that railway crossings could be secure, ETSI undertook what was termed the "window program" for obtaining rights-of-way from the railroads.

Extensive title searches were made of the railroad land grants that lay across the proposed route. Records indicated that all the railroads ETSI crossed were built under the Federal Railroad Acts of 1862 and 1864. ETSI's land division identified crossing points at or near the pipeline route where the land in question was held as an easement under the Railroad Land Grant Acts rather than in fee ownership. ETSI then began an extensive process of legally challenging the authority of the railroads to deny crossing requests, instituting 65 individual law suits against the railroads to establish ETSI's rights.

ETSI's window program was completely successful at the trial court level as well as in appellate review by both the Eighth and Tenth Federal Circuit Courts of Appeal and the Oklahoma Supreme Court. See Energy Tranportation Systems, Inc. v. Union Pacific Railroad Co., 606 F. 2d 934 (10th Cir. 1979); and Energy Transportation Systems, Inc. v. Kansas City Southern Railroad, 638 F. 2d 459 (Okla. 1981). Also, ETSI's final environmental impact statement issued by the Bureau of Land Management found the ETSI coal pipeline to be an environmentally sound way to transport coal.

Although this costly and time consuming litigation enabled ETSI to obtain rights-of-way to cross under specific rail lines, it had to realign the pipeline so that it would cross at the windows opened by the courts. This legal process added at least an additional $50 million to projected construction costs, but even more importantly, was the several years of delay and resultant uncertainty. Based on this record of obstruction, the ETSI partners are presently suing the major Western railroads for $8 billion in treble damages under the Sherman Anti-Trust Act. The case is being heard in Texas Federal District Court.

After $150 million spent by the ETSI partners, it is clear that the window program approach is not practical as a business approach in developing coal slurry pipeline projects. For coal pipelines in other areas of this nation, the window program approach is not possible because the railroads own the underlying land in fee. Furthermore, uncertainties in project timing and execution created by being unable to tie down rights of way make it exceedingly difficult to obtain binding commitments in marketing the coal to users.

(c) Legislative Precedence

As I indicated previously, similar difficulties led to the amendment of the Natural Gas Act in 1947 to grant federal eminent domain authority to interstate natural gas pipelines; the enactment of the Cole Act in 1941 to grant federal eminent domain authority to several interstate petroleum products consumed in the Washington area; the grant of federal eminent domain authority to the land grant railroads (Santa Fe, Union Pacific and Burlington Northern) in the 1860's; the grant of federal eminent domain authority to interstate bridge companies and to certain ty to the land grant railroads (Santa Fe, Union Pacific and Burlington Northern) in the 1860's; the grant of federal eminent domain authority to interstate bridge companies and to certain interstate electric transmission projects.

The enactment of federal eminent domain legislation in each of these instances allowed the development of interstate energy and transportation facilities that have provided enormous benefits to our nation and literally have changed the face of our country. The adoption of this federal eminent domain legislation will enable the nation to realize the substantial benefits of interstate coal pipeline systems.

CONCLUSION

Mr. Chairman, the case for interstate coal slurry pipelines is compelling. Interstate coal slurry pipelines will provide significant energy and economic benefits for the nation. But the development of these interstate systems needs to be facilitated by workable federal eminent domain legislation, such as S. 801 and H.R. 1531. We encourage the enactment of this legislation expeditiously in order that the benefits of long-distance coal pipelines can be realized.

OVERVIEW

The 12th International Conference on Slurry Technology

Irving Leibson

Chairman, Slurry Technology Association

Good Morning . . .

It is a pleasure to welcome you to the 12th Annual International Conference on Slurry Technology. We are particularly pleased to be sponsoring this year's conference jointly with the U.S. Department of Energy. The joint technical committee with representatives from the Slurry Technology Association and the Department of Energy has arranged a very comprehensive, outstanding program for you covering virtually every development which has occurred in the slurry field during the past year.

I wish to extend a special welcome to those of you who are visiting the United States. About one-fourth of our attendees came from outside the United States and this contributes greatly to the international character of the meeting. We hope you enjoy your stay in New Orleans and that you benefit substantially from the information presented at the meeting as well as informal visits with your associates in the field.

During the past year, the basic restructuring which has been occurring in the energy industry has continued. The price of oil has risen from its low level of early last year but considerable instability exists in the market place. The coal industry is struggling to maintain share-of-market in the face of diminished economic incentives for coal use. Imports of crude oil and refined products have greatly increased in the United States. The electric utility industry, a major fuel consumer, is facing considerable uncertainty in selecting the approaches to be followed in meeting the electricity requirements of the 1990's. The development of new clean coal technologies and low cost approaches to fuel transportation are essential to the preservation of U.S. competitiveness in international markets.

Let's take a look at the past, present, and future for slurry technologies. Slurry pipeline technology has evolved to its current stage of sophisticated development during the past 100 years. Early commercial applications in the latter half of the last century include transportation of gold bearing gravel in California for Placer Mining operations, pumping of anthracite culm slurries in Pennsylvania, and the use of the hydraulic sand and gravel dredges. In the early 1900's, coal was loaded in slurry form from barges in the Thames River to the boiler plant. In the 1920's ash and clinkers were transported from power plants to waste dumps. In the 1930's phosphate rock, sand, and clay were moved from open pit mines to washeries.

A number of slurry pipelines ranging in length from five to ten miles were built in the 1940's and '50's for transporting such materials as kaolin, nickel/copper concentrate, and limestone. In 1957 Americal Gilsonite initiated operation of a 72 mile 6" pipeline from its mine site in Utah to a refinery in Grand Junction, Colorado.

During the 1960's and '70's slurry pipelines were introduced to handle such materials as coal, iron concentrate, copper concentrate, phosphate, and tailings on a worldwide basis. Notable among these systems is the Black Mesa coal slurry pipeline which has been operating since 1970 transporting 5 million tons/day of coal in slurry form 273 miles from Black Mesa to the Mohave Station of Southern California Edison through an 18 inch diameter pipeline. The *Samarco* iron concentrate slurry pipeline in Brazil has been operating for about ten years transporting 12MM tons/year of iron concentrate in slurry form 247 miles through a 20 inch diameter pipeline. During the past 25 years, a total of 27 long distance slurry pipelines have been constructed with a combined length of more than 1700 miles and a total throughput of more than 60 million tons per year. The slurry pipeline technology involved is completely demonstrated on a commercial basis.

During the past ten years, substantial developments have taken place in new technology for the preparation and combustion of coal slurry fuels. You shall hear a number of papers during this meeting concerning this subject.

Coal-water slurry fuel preparation is an important component of clean coal technology. Coal-water fuels consist of approximately 70 percent finely pulverized coal, 29 percent water, and 1 percent chemicals additives. Coal-water fuels require no dewatering and no further pulverization, and are direct-fired, like residual fuel oil, into a boiler.

Coal-water fuels are a natural partner for deeply cleaned coal. To remove unwanted mineral matter present in coal, it is necessary to grind the coal to a fine powder. Many cleaning processes involve slurrying the coal with water. These are the physical processes required in the manufacture of coal-water fuels.

Important to solving our acid rain problem is the need to reduce the sulfur content of coal. Sulfur in coal is found mainly in two forms: iron pyrite and organic sulfur. A large percentage of the iron pyrite can be removed from coal by commercially available coal-cleaning processes. As for the organic sulfur, Atlantic Research Corporation has developed a microbe that will remove up to 47% of the organic sulfur in bituminous coals.

A combined physical and microbiological process can produce a clean coal at greater than 80% Btu recovery with less than 5% ash and a sulfur content decrease of 70–90%. The clean coal has been used for producing coal-water fuels.

With the present relationship between the price of residual fuel oil, natural gas, and steam coal, coal slurry fuels are only economic in special situations. However, these fuels may be expected to find increasing use as an alternate to fuel oil when prices rise above $25/bbl for residual fuel oil. They provide a clean, environmentally responsible alternative approach to coal usage in steam and electricity generation.

Major slurry projects currently being planned and underway worldwide include:

- The installation of 162 mile long, 20" diameter coal slurry pipeline in the Soviet Union to transport 4 million tons per year of coal from mines in Siberia.
- The installation of a phosphate slurry line 95 miles long, 10 inches in diameter over the Unita mountains from Vernal, Utah to Rock Springs, Wyoming by Chevron.
- The installation and developmental testing of a coal/carbon dioxide slurry line in a two mile teste loop 4 inches in diameter in Amarillo, Texas to evaluate 75% coal/25% carbon dioxide slurry by Southwestern Public Service and Kaiser Coal; with plans for a 300 mile long, 12 inch in diameter pipeline to transport 3 million tons per year of coal in a coal/carbon dioxide slurry from Raton, New Mexico to Lubbock, Texas.
- Construction of 100 mile long, 6 inch diameter copper concentrate slurry pipeline from the O.K. Teddi mine in Papua, New Guinea to Kiunga on the Fly River by Slurry Systems Pty. Ltd. of Sydney, Australia and Curtain Bros. of Townsville.
- At the planning stage, a 183 mile long, 18 inch diameter pipeline to transport 4.5 million tons per year of coal from the Alton surface coal mine Southwest of Bryce Canyon, Utah to the planned Harry Allen power plant 25 miles Northeast of Las Vegas, Nevada by Nevada Power Co. and Utah International Inc.

These projects show that the use of slurry technology can make an important contribution in the competitive generation and transportation of energy.

What does the future hold for slurry technology? We believe that coal slurry pipelines can provide the lowest cost alternative for the transport of coal over significant distances over land from the mines to point of use. In the United States, it is very important that steps be taken to permit coal slurry pipelines to enjoy the same right of eminent domain in obtaining right-of-ways that has been in effect for oil and gas pipelines for a number of decades now. We believe that the 100th Congress will pass a bill granting the right of eminent domain to coal slurry pipelines. An alliance of industry with organized labor will press for this legislation in the national interest. It is important to U.S. competitiveness in international markets for the cost of coal transportation from mine to point-of-use to be as low as possible.

It is projected that the construction of six major coal slurry pipelines in the U.S. would provide 37,500 construction jobs, 75,000 new jobs in the manufacturing industry, and 3,750 permanent jobs for operation of the pipelines. It is estimated that the 9 billion dollar projected pipeline cost would generate over 375,000 jobs in the economy. Furthermore, all of these jobs would be created without federal subsidy at no expense to the taxpayer.

Furthermore if six major coal slurry pipelines were to be constructed, approximately 2 million tons of steel pipe would be required and this would give a significant lift to the steel industry.

As the worldwide mineral industry recovers from its current depressed level, there will be further applications of slurry pipeline technology in the transport of coal, phosphate, potash, iron concentrate, bauxite, and copper concentrate. There will also be new applications such as reservoir silt removal, underground mining of uranium, and sand fill for underground mine support. Furthermore, new increasingly cost effective technical approaches to long distance pipeline transport to coal slurries will be commercialized using stabilized concentrated coal water mixes and even coal/carbon dioxide slurries.

The future looks promising but economic factors are critical. The Slurry Technology Association will continue to serve as the key forum for the exchange of technical information in positioning the industry for long-term growth.

The CHAIRMAN. Thank you very much, Doctor.
Mr. Boede?

STATEMENT OF MARVIN J. BOEDE, GENERAL PRESIDENT, UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES, PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA, ON BEHALF OF THE BUILDING AND CONSTRUCTION TRADES DEPARTMENT, AFL-CIO

Mr. BOEDE. Mr. Chairman and members of the committee, I am Marvin Boede, the general president to the 350,000 member United Association of Plumbers and Pipefitters. I am here today to testify in strong support of S. 801, the Coal Distribution and Utilization Act of 1987.

I would point out also that I am a vice president of the Building and Construction Trades Department, AFL-CIO, made up of 15 national and international unions in the construction industry. I am fully authorized to speak for that department which has repeatedly and unanimously passed resolutions supporting eminent domain legislation for coal pipelines. All together the unions making up this department total more than 4 million members.

Mr. Chairman, although this is the first time I have testified before Congress on this issue, representatives of my union, the United Association, and representatives of other construction unions, as well as President Robert Georgine of the Building and Construction Trades Department, have testified many times in recent years in support of coal slurry pipelines.

We have the trained manpower that can build these pipelines, and we have a deeply felt need to provide more job opportunities for construction workers who are always hit the hardest by rising unemployment in the American economy.

But there is another and more compelling reason to enact this legislation, a reason that impacts on every citizen and every worker no matter what his occupation happens to be. We must have an increased measure of energy independence or our national security will continue to be jeopardized and undermined by foreign nations, often our bitter foes, who control so much of the flow of oil in international commerce.

The astonishing and incredibly dangerous events now unfolding in the Middle East ought to make it clear to all of us where energy security is concerned, we are most certainly living in a fool's paradise.

A special report on energy from the Senate's Democratic Policy Committee just last month said, "The United States is heading full speed into another energy crisis and the resulting nightmares." The report added that the United States now has an energy policy "dictated by OPEC pricing practices, with the looming potential for the same consequences we experienced in 1973 and 1979."

So, where do we turn? To many of us the answer is obvious: we turn to coal. We have coal resources unmatched by any other nation on earth. One-third of the known coal resources are located right here in these United States, and they will last for hundreds and hundreds of years.

Anything we can do to promote increased use of coal to replace oil in the power plant of American industry, especially in the production of electricity should be done, and it should be done immediately.

And gentlemen, I submit the bill you have before you is the single most important measure that will ultimately provide incentive for industry to build and operate coal-fired boilers rather than oil-fired boilers.

One of the major stumbling blocks has been and continues to be the soaring costs of transporting coal from the mine to the boiler. That is not to say that coal pipelines are always more economical than railroad cars or barges, but as the Office of Technology Assessment pointed out in its study, sometimes pipelines can do the job better and they can do it cheaper.

Coal pipelines are made up of welded sections of steel pipe buried deep under the ground. These lines provide a steady delivery system virtually immune from mishap.

Coal slurry pipelines are almost identical in design as liquid and gas lines. The only real difference is there pumps. Coal are specially designed to handle the mixture of water and pulverized coal which is ground about as fine as sugar. The rest of the pipeline system is virtually the same. There is nothing complicated or experimental about coal slurry pipelines.

The bill before you calls for no government subsidy, no expenditures of Federal revenue, strict compliance with all environmental protection statutes and expressly delegates to the States the power to regulate the use or export of water in the interstate coal slurry pipeline system.

In order to give the committee some insight into the job impact of this bill before you, let me cite the numbers developed by the Bechtel Corp. shortly before the 1983 vote on a similar bill. Using standard Bureau of Labor methods, it was estimated that construction of seven pipelines would have created 50,000 jobs for construction workers. Another 100,000 jobs would have been created in the construction support sector, and another 350,000 in the production of valves, pumps, steel and heavy equipment, for a grand total of 500,000 jobs for the seven pipelines.

Defeat of that 1983 bill, in effect, also cancelled the need for 2.9 million tons of steel piping. That figure represents twice the annual average in the 1970's for the production of line pipe.

And remember that the creation of jobs goes far beyond the initial construction of pipelines. For many utilities lowering the delivered price of coal would provide incentive for expanding existing power plants and even building new coal-fired plants.

Furthermore, because coal pipelines are particulary well-suited to deliver coal to ships for the export market, a market that is sitting there waiting for American coal producers, jobs would be created to build new marine terminals and shipyard workers would benefit from an increased need for barges, tankers and other ocean-going vessels.

On that point I hope the committee will give full weight to the impact this bill would have on international trade. It would lower oil imports, and it would increase coal exports thereby helping to reduce the enormous trade deficit from which every American citizen is suffering.

It is estimated, for example, that Japan alone will account for 50 percent of the world's steam coal demand by 1990. Wouldn't it be nice for a change, to sell more American coal to Japan than they sell automobiles to us?

As for railroad jobs, the Energy Information Administration of the Department of Energy has projected a 230 million ton rise in coal production from 1984 to 1995. And EIA concluded that even if four coal pipelines were in operation by 1995, railroad revenues from coal cartage would still be almost 60 percent higher and railroad ton miles nearly 30 percent higher in 1995 than in 1984.

In any case, since when does fear of competition carry the day in America? Since when do we say monopoly is good and competition is bad? In the hauling of coal the marketplace is not free. That is why this Nation needs this bill. I think it is outrageous that the railroad industry, using the property right ceded it by the government, has been allowed to obstruct and deprive the American people and American industry of the right to decide for themselves whether they can or cannot make use of coal slurry pipeline technology.

Mr. Chairman, members of the committee, that is all we are asking for is a chance to compete in the marketplace.

And Mr. Chairman, that concludes my statement.

[The prepared statement of Mr. Boede follows:]

TESTIMONY OF

MARVIN J. BOEDE, GENERAL PRESIDENT

UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES

OF THE PLUMBING AND PIPEFITTING INDUSTRY

OF THE UNITED STATES AND CANADA

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES

U. S. SENATE

SEPTEMBER 10, 1987

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE, I AM MARVIN J. BOEDE, GENERAL PRESIDENT OF THE 335,000-MEMBER UNITED ASSOCIATION OF PLUMBERS AND PIPEFITTERS, AND I AM HERE TODAY TO TESTIFY IN STRONG SUPPORT OF S.801, THE COAL DISTRIBUTION AND UTILIZATION ACT OF 1987.

I SHOULD POINT OUT ALSO THAT I AM VICE PRESIDENT OF THE BUILDING AND CONSTRUCTION TRADES DEPARTMENT OF THE AFL-CIO, MADE UP OF 15 NATIONAL AND INTERNATIONAL UNIONS IN THE CONSTRUCTION INDUSTRY, AND I AM FULLY AUTHORIZED TO SPEAK FOR THE DEPARTMENT WHICH HAS REPEATEDLY AND UNANIMOUSLY PASSED RESOLUTIONS SUPPORTING EMINENT DOMAIN LEGISLATION FOR COAL PIPELINES. ALTOGETHER THE UNIONS MAKING UP THE DEPARTMENT TOTAL MORE THAN 4 MILLION MEMBERS.

MR. CHAIRMAN, ALTHOUGH THIS IS THE FIRST TIME I HAVE TESTIFIED BEFORE CONGRESS ON THIS ISSUE, REPRESENTATIVES OF MY UNION, THE UNITED ASSOCIATION, AND REPRESENTATIVES OF OTHER CONSTRUCTION UNIONS, AS WELL AS PRESIDENT ROBERT GEORGINE OF THE BUILDING AND CONSTRUCTION TRADES DEPARTMENT, HAVE TESTIFIED MANY TIMES IN RECENT YEARS IN SUPPORT OF COAL PIPELINES.

AND, I MUST SAY THAT THE REASONS FOR OUR TESTIMONY ARE EVEN MORE COMPELLING TODAY THAN THEY WERE IN THE PAST.

WE HAVE THE TRAINED MANPOWER THAT CAN BUILD THESE PIPELINES AND WE HAVE A DEEPLY-FELT NEED TO PROVIDE MORE JOB OPPORTUNITIES FOR CONSTRUCTION WORKERS WHO ARE ALWAYS HIT THE

HARDEST BY RISING UNEMPLOYMENT IN THE AMERICAN ECONOMY.

BUT THERE IS ANOTHER COMPELLING REASON TO ENACT THIS BILL, A REASON THAT IMPACTS ON EVERY CITIZEN AND EVERY WORKER NO MATTER WHAT HIS OCCUPATION HAPPENS TO BE.

WE MUST HAVE AN INCREASED MEASURE OF ENERGY INDEPENDENCE OR OUR NATIONAL SECURITY WILL CONTINUE TO BE JEOPARDIZED AND UNDERMINED BY FOREIGN NATIONS, OFTEN OUR BITTER FOES, WHO CONTROL SO MUCH OF THE FLOW OF OIL IN INTERNATIONAL COMMERCE.

THE ASTONISHING AND INCREDIBLY DANGEROUS EVENTS NOW UNFOLDING IN THE MIDDLE EAST OUGHT TO MAKE IT CLEAR TO ALL OF US THAT, WHERE ENERGY SECURITY IS CONCERNED, WE ARE MOST DECIDEDLY LIVING IN A FOOL'S PARADISE.

I CANNOT UNDERSTAND WHY IT TAKES A CRISIS AND THE DRAMATIC EVIDENCE OF GAS RATIONING AND LONG LINES OF CARS AT THE PUMPS TO BRING HOME TO THE AMERICAN PEOPLE THAT THIS IS A PROBLEM THAT WILL NOT GO AWAY AND MUST BE DEALT WITH. YOU CAN ONLY COURT DISASTER FOR SO LONG.

A SPECIAL REPORT ON ENERGY FROM THE SENATE'S DEMOCRATIC POLICY COMMITTEE JUST LAST MONTH SAID, "THE UNITED STATES IS HEADING FULL SPEED INTO ANOTHER ENERGY CRISIS AND ITS ACCOMPANYING NIGHTMARES". THE REPORT ADDED THAT THE UNITED STATES NOW HAS AN ENERGY POLICY "DICTATED BY OPEC PRICING PRACTICES, WITH THE LOOMING POTENTIAL FOR THE SAME CONSEQUENCES WE EXPERIENCED IN 1973 AND 1979."

FOLLOWING THOSE TWO ENERGY CRISES OF 1973 AND 1979, THE GOVERNMENT IN BOTH REPUBLICAN AND DEMOCRATIC ADMINISTRATIONS, DEVELOPED A VARIETY OF PROGRAMS AND POLICIES DESIGNED TO MOVE THE NATION TOWARD A LARGER DEGREE OF ENERGY INDEPENDENCE. THEY INCLUDED THE SYNTHETIC FUELS DEVELOPMENT PROGRAM, INCREASED FEDERAL SUPPORT FOR OTHER ALTERNATIVE ENERGY TECHNOLOGIES AND FOR ENERGY CONSERVATION MEASURES, ELECTRICAL APPLIANCE EFFICIENCY STANDARDS, PROGRAMS TO ENCOURAGE CONVERSION TO COAL-FIRED BOILERS AND FULL DEVELOPMENT OF THE STRATEGIC PETROLEUM RESERVE.

YET, AS THE JOINT ECONOMIC COMMITTEE SAID IN ITS ANNUAL REPORT FOR 1987, ALL THE PROGRESS MADE SINCE 1981 IN REDUCING CONSUMPTION OF IMPORTED OIL WAS CANCELLED OUT IN 1986 WHEN IMPORTED PETROLEUM ACCOUNTED FOR 37 PERCENT OF TOTAL U.S. DEMAND.

THAT IS A HIGHER PERCENTAGE OF IMPORTED OIL THAN AT THE HEIGHT OF THE 1973 ARAB OIL EMBARGO WHEN IMPORTED PETROLEUM CONSTITUTED 35 PER CENT OF AMERICAN OIL CONSUMPTION. IN FACT, IN 1986 ALONE, THE VOLUME OF IMPORTED OIL INCREASED BY 24 PER CENT.

AT ONE TIME IT WAS WIDELY BELIEVED THAT THE ANSWER TO DWINDLING DOMESTIC OIL SUPPLIES WAS NUCLEAR POWER. BUT WE ALL KNOW WHAT HAPPENED TO THAT DREAM OF ENDLESS ENERGY SUPPLY. AND THERE IS NOTHING TO SUGGEST THAT THE OVERWHELMING OBSTRUCTIONS TO NEW NUCLEAR FACILITIES WILL DISAPPEAR IN THE NEAR OR FORSEEABLE FUTURE.

SO WHERE DO WE TURN? TO MANY OF US THE ANSWER IS OBVIOUS. WE TURN TO COAL.

WE HAVE COAL RESOURCES UNMATCHED BY ANY NATION ON EARTH. ONE-THIRD OF THE KNOWN COAL RESOURCES ARE LOCATED RIGHT HERE IN THE UNITED STATES AND THEY WILL LAST FOR HUNDREDS OF YEARS, PERHAPS EVEN A MILLENIUM.

ANYTHING WE CAN DO TO PROMOTE INCREASED USE OF COAL TO REPLACE OIL IN THE POWERPLANT OF AMERICAN INDUSTRY, ESPECIALLY IN THE PRODUCTION OF ELECTRICITY, SHOULD BE DONE AND DONE FORTHWITH.

AND, GENTLEMEN, I SUBMIT THE BILL YOU HAVE BEFORE YOU IS THE SINGLE MOST IMPORTANT MEASURE THAT WILL ULTIMATELY PROVIDE INCENTIVE FOR INDUSTRY TO BUILD AND OPERATE COAL-FIRED BOILERS RATHER THAN OIL-FIRED BOILERS.

ONE OF THE MAJOR STUMBLING BLOCKS HAS BEEN AND CONTINUES TO BE THE SOARING COSTS OF TRANSPORTING COAL FROM THE MINE TO THE BOILER.

THAT IS NOT TO SAY THAT COAL PIPELINES ARE ALWAYS MORE ECONOMICAL THAN RAILROAD CARS OR BARGES. BUT AS THE OFFICE OF TECHNOLOGY ASSESSMENT POINTED OUT IN ITS STUDY, SOMETIMES PIPELINES CAN DO THE JOB BETTER AND CHEAPER.

THIS BILL WILL MAKE COAL MORE READILY AVAILABLE TO AMERICAN INDUSTRY. IT WILL INCREASE COAL TRANSPORTATION OPTIONS BY REMOVING A BARRIER TO ENTRY FOR NEW COMPANIES WHO

SIMPLY WANT A CHANCE TO PROVIDE HEALTHY COMPETITION IN THE TRANSPORTATION OF COAL.

PIPELINES HAVE CLEARLY BEEN DEMONSTRATED TO BE ONE OF THE SAFEST, MOST RELIABLE AND MOST ECONOMICAL HAULAGE METHODS EVER DEVELOPED.

THEY ARE COMPOSED OF WELDED SECTIONS OF STEEL PIPE BURIED DEEP UNDER THE GROUND. THEY PROVIDE AN UNINTERRUPTED SEAMLESS HAULAGE SYSTEM WITH EXTRAORDINARY INTEGRITY. THE LINES ARE VIRTUALLY IMMUNE FROM MISHAP.

COAL SLURRY PIPELINES ARE ALMOST IDENTICAL IN DESIGN TO GAS AND LIQUID LINES. THE ONLY REAL DIFFERENCE IS IN THEIR PUMPS. COAL SLURRY PUMPS ARE SPECIALLY DESIGNED TO HANDLE THE MIXTURE OF WATER AND PULVERIZED COAL WHICH IS GROUND ABOUT AS FINE AS SUGAR. THE REST OF THE PIPELINE SYSTEM IS VIRTUALLY THE SAME. THERE IS NOTHING COMPLICATED OR EXPERIMENTAL ABOUT THE COAL SLURRY LINES.

THE LONGEST COAL SLURRY PIPELINE NOW OPERATING RUNS FROM THE BLACK MESA, ON THE NAVAHO INDIAN RESERVATION IN ARIZONA, TO THE MOHAVE POWER PLANT ON THE COLORADO RIVER IN SOUTHERN NEVADA. THE LINE IS 273 MILES LONG. IT CONSISTS OF WELDED STEEL PIPE EIGHTEEN INCHES IN DIAMETER. IT STARTED OPERATION IN 1970, AND IT HAS RARELY BEEN SHUT DOWN, MAINTAINING AN AVAILABILITY OF BETTER THAN 99 PER CENT.

THE ENERGY EFFICIENCY OF A COAL SLURRY PIPELINE IS 96 PER CENT. IN OTHER WORDS, ONLY FOUR PER CENT OF THE ENERGY

VALUE OF THE COAL IS ABSORBED IN THE HAULAGE PROCESS. AND UNLIKE MOST TRANSPORTATION SYSTEMS, THIS ENERGY IS SUPPLIED BY THE COAL ITSELF, IN THE FORM OF ELECTRICAL ENERGY TO RUN THE PUMPING STATIONS. I MIGHT POINT OUT THAT PUMPING STATIONS ARE BUILT EVERY FIFTY TO ONE HUNDRED MILES ALONG THE PIPELINE ROUTE, DEPENDING UPON THE TERRAIN.

THE BILL BEFORE YOUR COMMITTEE PROVIDES AN ALTERNATIVE SYSTEM FOR DELIVERING COAL TO BULK USERS THAT IS COMPETITIVE, EFFICIENT AND ENVIRONMENTALLY SOUND.

IT CALLS FOR NO GOVERNMENTAL SUBSIDY, NO EXPENDITURES OF FEDERAL REVENUE, STRICT COMPLIANCE WITH ALL ENVIRONMENTAL PROTECTION STATUTES AND EXPRESSLY DELEGATES TO THE STATES THE POWER TO REGULATE THE USE OR EXPORT OF WATER IN THE INTERSTATE COAL SLURRY PIPELINE SYSTEM.

THIS LEGISLATION GIVES NO GUARANTEE THAT A PIPELINE WILL BE BUILT. IT WILL ONLY ENSURE THE RIGHT TO COMPETE FOR THE TRANSPORTATION OF COAL FROM THE MINE MOUTH TO THE USER.

WE BELIEVE ENACTMENT OF THIS LEGISLATION WILL ENHANCE NATIONAL ENERGY SECURITY AND, AT THE SAME TIME, LOWER THE COST OF ELECTRICITY TO THE CONSUMER WITHOUT THE EXPENDITURE OF SCARCE FEDERAL DOLLARS --- A POINT WHICH CANNOT BE OVEREMPHASIZED.

THIS BILL ALSO HAS THE POTENTIAL TO REVITALIZE THE SUFFERING AMERICAN STEEL INDUSTRY BECAUSE OF THE NEED FOR STEEL PIPE IT WOULD CREATE.

IT WOULD PROVIDE JOBS IN CONSTRUCTION AND MANUFACTURING INDUSTRIES.

AND, IT WOULD REDUCE OIL IMPORTS AND INCREASE COAL EXPORTS, THEREBY HELPING TO REDUCE THE ENORMOUS TRADE DEFICIT FROM WHICH ALL INDUSTRY AND ALL CONSUMERS CONTINUE TO SUFFER GRIEVOUSLY.

IN ORDER TO GIVE THE COMMITTEE SOME INSIGHT INTO THE JOBS IMPACT OF THE BILL BEFORE YOU, LET ME CITE THE STATISTICS DEVELOPED BY THE BECHTEL CORPORATION SHORTLY BEFORE THE 1983 VOTE ON A SIMILAR BILL.

USING STANDARD BUREAU OF LABOR STATISTICS METHODOLOGY IT WAS ESTIMATED THAT CONSTRUCTION OF SEVEN PIPELINES WOULD HAVE CREATED 50,000 JOBS FOR CONSTRUCTION WORKERS, INCLUDING PIPEFITTERS, OPERATING ENGINEERS, LABORERS, TEAMSTERS, BOILERMAKERS, CARPENTERS, ELECTRICIANS, IRON WORKERS, CEMENT MASONS, MILLWRIGHTS, AND OTHERS.

ANOTHER 100,000 JOBS WOULD HAVE BEEN CREATED IN THE CONSTRUCTION SUPPORT SECTOR AND ANOTHER 350,000 IN THE PRODUCTION OF VALVES, PUMPS, STEEL AND HEAVY EQUIPMENT FOR A GRAND TOTAL OF 500,000 JOBS FOR THE SEVEN PIPELINES.

IT HAS BEEN ESTIMATED THAT $2,817,000,000 IN WAGES WOULD HAVE BEEN PAID JUST TO THE 50,000 CONSTRUCTION WORKERS IF THOSE SEVEN PIPELINES HAD BEEN BUILT.

DEFEAT OF THAT 1983 BILL, IN EFFECT, ALSO CANCELLED THE

NEED FOR 2.9 MILLION TONS OF STEEL PIPING. THAT FIGURE REPRESENTS TWICE THE ANNUAL AVERAGE IN THE 1970'S FOR THE PRODUCTION OF LINE PIPE.

AND REMEMBER THAT THE CREATION OF JOBS GOES FAR BEYOND THE INITIAL CONSTRUCTION OF PIPELINES. FOR MANY UTILITIES, LOWERING THE DELIVERED PRICE OF COAL WOULD PROVIDE INCENTIVE FOR EXPANDING EXISTING POWER PLANTS AND EVEN BUILDING NEW COAL-FIRED PLANTS.

FURTHERMORE, BECAUSE COAL PIPELINES ARE PARTICULARLY WELL SUITED TO DELIVER COAL TO SHIPS FOR THE EXPORT MARKET -- A MARKET THAT IS SITTING THERE FOR AMERICAN COAL PRODUCERS -- JOBS WILL BE CREATED TO BUILD NEW MARINE TERMINALS AND SHIPYARD WORKERS WOULD BENEFIT FROM AN INCREASED NEED FOR BARGES, TANKERS AND OTHER OCEAN-GOING VESSELS. IT IS ESTIMATED, I MIGHT ADD, THAT JAPAN ALONE WILL HAVE A DEMAND FOR 50 PER CENT OF THE WORLD'S STEAM COAL DEMAND BY 1990. AS I RECENTLY SAID TO MY OWN UNION MEMBERS, "WOULDN'T IT BE A NICE CHANGE TO SELL MORE AMERICAN COAL TO JAPAN THAN THEY SELL CARS TO US?"

BUT IN ORDER TO DO THIS WE MUST BE MORE COMPETITIVE WITH FOREIGN COAL PRODUCERS, AND PIPELINES WILL HELP MOVE US IN THAT DIRECTION.

IT IS THE HEIGHT OF IRONY THAT EVEN AS WE ARE CALLED THE SAUDI ARABIA OF COAL BECAUSE OF OUR ENORMOUS COAL RESOURCES, WE ARE ONE OF THE WORLD'S LEADING IMPORTERS OF COAL AT AN ANNUAL RATE OF ABOUT 2 MILLION TONS NOW AND 3 MILLION TONS

FORECAST BY D.O.E. BY 1989. AND, IN AN EVEN MORE PESSIMISTIC REPORT, THE COMMERCE DEPARTMENT HAS WARNED THAT WE COULD BE IMPORTING AS MUCH AS 17.7 MILLION TONS OF COAL BY 1990.

ON THE OTHER SIDE OF THAT LEDGER, AMERICAN COAL EXPORTS HAVE FALLEN SHARPLY TO 85 MILLION TONS IN 1986, FROM A PEAK OF 113 MILLION TONS IN 1981, AND NO SIGNIFICANT IMPROVEMENT IS EXPECTED BY D.O.E. IN THE YEARS IMMEDIATELY AHEAD.

IF THIS BILL IS ENACTED, I BELIEVE WE CAN REVERSE THOSE TRENDS AND I BELIEVE THERE WILL BE PLENTY OF COAL TO KEEP ALL THE MODES OF TRANSPORTATION BUSY.

IT PAINS ME TO COME INTO CONFLICT WITH OUR BROTHERS AND SISTERS IN THE RAILROAD INDUSTRY. BUT THEIR SCENARIO OF DISASTROUS CONSEQUENCES IN THAT INDUSTRY SIMPLY DOES NOT SQUARE WITH REALITY. EVEN THE MOST OPTIMISTIC FORECASTS SUGGEST THAT PIPELINES WOULD BE COMPETITIVE ENOUGH TO CARRY ONLY 20 PER CENT OF ALL THE COAL TRANSPORTED.

BUT, IF THIS BILL PASSES AND INDUSTRY DOES INDEED BEGIN TO CONVERT TO COAL, IT WILL BE 20 PER CENT OF A MUCH BIGGER PIE. AND I SUGGEST THAT THE RAILROADS SHOULD CONSIDER THAT 80 PER CENT OF A BIGGER PIE MAY BE MORE SUBSTANTIAL THAN 100 PER CENT OF A SMALLER PIE.

IN FACT, THE ENERGY INFORMATION ADMINISTRATION OF THE DEPARTMENT OF ENERGY HAS PROJECTED A 230 MILLION TON RISE IN COAL PRODUCTION FROM 1984 TO 1995. AND E.I.A. CONCLUDED

THAT, EVEN IF FOUR COAL PIPELINES WERE IN OPERATION BY 1995, "RAILROAD REVENUES FROM COAL CARRIAGE WOULD STILL BE ALMOST 60 PER CENT HIGHER AND RAILROAD TON-MILES NEARLY 30 PER CENT HIGHER IN 1995 THAN IN 1984".

IN ANY CASE, SINCE WHEN DOES FEAR OF COMPETITION CARRY THE DAY IN AMERICA? SINCE WHEN DO WE SAY MONOPOLY IS GOOD AND COMPETITION IS BAD?

IN THE HAULING OF COAL, THE MARKETPLACE IS NOT FREE. THAT'S WHY THE NATION NEEDS THIS BILL.

WITHOUT THE KIND OF CONTROLLED EMINENT DOMAIN PROCEDURE THIS BILL PROVIDES, THE RAILROADS WILL CONTINUE TO FORCE PIPELINE DEVELOPERS INTO ENDLESS AND EXPENSIVE LITIGATION THAT HAS MADE PIPELINE CONSTRUCTION NON-FEASIBLE UP TO THE PRESENT MOMENT.

I THINK IT IS OUTRAGEOUS THAT THE RAILROAD INDUSTRY, USING THE PROPERTY RIGHTS CEDED TO IT BY GOVERNMENT, HAS BEEN ALLOWED TO GET AWAY WITH BLATANTLY OBSTRUCTIONIST TACTICS TO DEPRIVE THE AMERICAN PEOPLE AND AMERICAN INDUSTRY OF THE RIGHT TO DECIDE FOR THEMSELVES WHETHER THEY CAN OR CANNOT MAKE USE OF THE COAL SLURRY PIPELINE TECHNOLOGY.

THAT IS ALL WE WANT, A CHANCE TO COMPETE. AND THAT IS ALL THIS BILL DOES.

The CHAIRMAN. Thank you very much, gentlemen, for excellent statements.

You know, this is a very interesting study in American democracy as far as I am concerned. I have been dealing with these coal slurry pipelines now for—or for the hope of a coal slurry pipeline now for many years. And it keeps fading away. And I must say I tip my hat to Bill Dempsey and the great people from the railroads who have taken a very bad case and with exquisite skill kept the Congress from doing what is right. [Laughter.]

And you know, it is funny. The arguments are all phony arguments. I say that in all sincerity. I mean, what we argue about, like water, that's as phony an argument as there ever was, like you are going to use all the water in the West for a coal slurry pipeline. That's baloney. It is not going to use the water in the West. It's a very small amount of water.

And they argue about pollution of water. And as you say, Doctor, in your statement, it is a technologically and an economically very easy case to clean up the water.

And they argue about States' rights. Well, that's a baloney argument, you know. In 1987 to be talking about States' rights with respect to a pipeline when the country is crisscrossed with oil pipelines and gas pipelines and eminent domain and all that, that's a baloney issue.

I mean, this is a gut issue of jobs and profit. And we ought to understand that. And there is nothing wrong with that. I mean, if I were in the railroads and I had a way to load up the coal industry and the utilities, who are after all utilities, and load them up with this big cost, and swell the profits of my railroad, why, of course, I would do it. Of course.

And that's why I say I tip my hat to the railroad industry because their profitability is going up. They have a responsibility to their shareholders, and they are fulfilling that responsibility very well to the detriment of the country I think, but nevertheless, that is what—I mean, they don't elect railroad executives not to make profits. They elect them to maximize those profits.

So, I hope, as these hearings go on, we will look at the national interests. And we can praise our friends in the railroad industry for good legislative work, but listen to their arguments only insofar as they relate to the national interests.

And so far as the national interest is concerned, it is true, is it not, Mr. Boede, that the cleanup of the water is technologically and economically easy?

Mr. BOEDE. Are you talking to me?

The CHAIRMAN. No. Excuse me. Dr. Leibson.

Dr. LEIBSON. Yes, sir. The technology is at hand. Indeed, when the ETSI pipeline was in the process of being organized, an environmental impact statement was prepared and was issued. So, it was approved and issued. The technology is at hand.

The CHAIRMAN. Now, did I overstate the fact that water is no problem here? I mean, in this legislation we have acquisition of water according to the strongest States' rights position. The amount of water relative to the starting point of the various pipelines proposed is not, in fact, a problem, is it?

Dr. LEIBSON. No, sir. It is not a problem.

The CHAIRMAN. Now, Dr. Leibson, you had some figures on commodities. You point the cost is not available from the railroads as to what the cost of shipping coal is.

But you point out that according to the Bureau of Labor Statistics, the cost of shipping all commodities—that index went up from 100 in 1969 to 308.7 in 1985, whereas the cost of coal went up from 100 to 403.20, almost 100 points above the cost of all commodities.

Now, this would suggest—this would more than suggest—this would shout with unimpeachable, absolute evidence that coal is being put upon. The utilities are being used as a profit center because they are captive shippers, in effect, to the tune of about 100 points on the BLS index, would it not?

Dr. LEIBSON. Yes, sir. And to further put the issue into perspective, it is important that we all recognize that in many cases the cost of rail transportation is half or even as much as two-thirds the price of the coal delivered to the point of use. That says that we are paying an extremely exorbitant price for transportation of coal.

And it hurts us. It is inflationary in the United States. It hurts the consumer in the cost of electricity. It hurts us on being able to export our steam coal overseas.

The CHAIRMAN. Now, on that question of export, I know there are some utilities in Florida, in Texas and somewhere else that have been using imported coal, some from as far away as South Africa, Australia.

Dr. LEIBSON. Yes, sir. Colombia, Australia, South Africa, Canada—all are selling steam coal in the United States.

The CHAIRMAN. To me it is the height of absurdity that our rail rates are so high that you can ship coal all the way from Australia. That is almost too far for me to travel to during a recess. [Laughter.]

My thirst for factfinding is almost without limit, and yet the sacrifice of traveling that far is almost too far. And yet, you can take coal from Australia and ship it all the way to this country and do it cheaper than you can ship domestic coal across the country.

Now, that is absurd. That is an outrage. And yet, they come in here with these smiles and this logic and say, oh, it is all fair. Oh, it is so reasonable—us railroads. We are just charging the bare, minimum cost.

And then you start to build a coal slurry pipeline. Where was that? Was it Arkansas Power & Light that was going to build that coal slurry pipeline? We had a little motion and movement going. You should have seen the railroads come in to Arkansas Power & Light. Boy, those costs, which had been at rock bottom for all those years, when there was even a real hint that we were going to build a coal slurry pipeline, my God, those costs fell like in a free fall. They outbid one another—those railroads. And they shut that coal slurry pipeline down flat with low rail rates.

Now, the trouble is you have to be in a position like Arkansas Power & Light was to have a real threat of building a coal slurry pipeline. If you can, you will find those rates to fall. You will find that those rock bottom rates that they talk about, below which they cannot go without breaking the railroad, are just so much hogwash that they are set artificially high because they have got captive shippers. And we are just dumb enough to let them do it. I mean, it is just as clear as that to me.

All this is by way of praise to my friend Bill Dempsey. [Laughter.]

Dempsey and I were in the Army together, and I know how smart he was back then. And Dempsey, they ought to raise your pay, I tell you. [Laughter.]

I don't know whether I had a question. Am I right? [Laughter.]

Answer yes or no.

Let the record reflect that the witness smiled which the chairman took to mean yes. And I will, therefore, call on Senator Ford.

Senator FORD. Your phony issues touched my heart.

This is a somewhat different bill than we had before. The proposed coal slurry pipeline coming through my State did not have the ability of my coal operators to join in and be able to ship some coal at that time.

Eminent domain is one thing, and eminent domain to ruin a business or reduce its income is another. When you buy something and you are operating a business, it seems strange to me that you want eminent domain to go through that fee simple property to reduce their ability to make money.

That is my gut problem. I don't care how good the technology is. We sit here and say how great the coal slurry pipeline is going to be. We cannot even get clean coal technologies out that would do far more, build more cars, use more steel, hire more people than a coal slurry pipeline. We sit here and argue about something that only a few people want.

And we talk about coal being shipped into this country from other countries. Who is paying for it? The taxpayer is paying for it out of the general fund with grants and low interest loans to build a mine mouth and a railroad and a deep port. We cannot even get a deep port here. Then the importers undersell my operators in eastern Kentucky by a nickel a ton.

You know, there are a lot of things you can talk about how great they are, but there is also the other side of the nickel and it is usually tails.

I want to talk to my good friend from labor just a minute. On page 9 of your testimony it says, "It pains me to come into conflict with our brothers and sisters in the railroad industry. But their scenario of disastrous consequences in that industry simply does not square with reality."

I want to find out what "square" is, if you can tell me. And I think it is tougher to lose a job than not to get one you expect.

Now, in the testimony from Mr. Kilroy we will see here later, it says—and it starts on page 3:

> The 1978 OTA Report has been extensively quoted and relied upon by opponents of coal slurry pipelines since its issuance. That report concluded that the five pipelines then being considered for construction would by the year 2000 result in the loss of 16,000 railroad jobs at a time when employment in industry would be about 365,000. But employment in the railroad industry is now nearly as low as that then predicted by OTA for the year 2000, having plummeted from 515,000 in July of 1981 to 388,000 in January of 1983; a drop of 25 percent in 18 months. It is even less than that today. Some 70,000 railroad employees are now on furlough. Consequently, in the year 2000 some 6 percent of the railroad work force could lose their jobs because of the construction of only five coal slurry pipelines.

How does that statement square with your statement?

Mr. BOEDE. Well, I think, Senator, the issue here is that the development of coal slurry pipelines would without a doubt have a tendency and a reality to create the necessary competition in order to reduce these delivered coal prices to a point where the creation of electricity would induce industry to make additional investments—and, of course, those are permanent jobs as opposed to construction jobs—that the entire economy would be stimulated, that we would be talking about a much larger pie as opposed to a smaller pie. And if the rail industry got 70 percent of the large pie as opposed to 90 percent of the smaller pie, it would seem to me that those numbers could be significantly higher even with a lesser percentage. And I think that that is the crux of the whole thing, Senator.

Senator FORD. Well, is it like the——

Mr. BOEDE. And that is how it squares.

Senator FORD. Is it like the Reagan administration? We are going to have a balanced budget in 1983, and everything is going to be great by 1988? We find our deficit doubled, high unemployment rate, and of the jobs have been created in the last 6 years, the average pay is $7,000. Is that what you are looking——

Mr. BOEDE. Well, we are talking about deficit. When you are talking about deficit, of course, you are talking about the system as it exists today.

Senator FORD. That is correct.

Mr. BOEDE. We are talking about an alternative. We are talking about a way to remedy, if you will, that deficit by exporting this commodity of which we have so much and is in so much demand.

And unless we get aboard and get aboard soon in terms of exporting coal throughout the world, we are going to lose that market to the people that you mentioned before, Australia, China, and the rest of them. They are already developing these kinds of systems. And we better get hot and get in the game.

Senator FORD. And our people are developing them, you know, in competition with our people here at home. And you are interested in the trade bill, and you are interested in shipping and exporting. I understand that. But when our people are there setting up the operation, have a 27, 28, 30 year lease on the property and do all that, then our jobs are going overseas. They are not staying here. And we sit here on our duff and not moving clean coal technologies.

You say to the railroad that we want to come across your property. We cannot get across it now because you will not deal with us. And you would not blame them. If somebody wanted to reduce your membership by half or a third or 20 percent, whatever it might be, you would not want us to pass a law that would create that. We are saying to the railroads we want to come across your property and give you competition when they have already been in business for a long time.

Something about that just does not fly right with me. I am caught in a position between my railroad brothers. You know? And you put me in a bad situation. They were for me early, been for me ever since. Damned if I am going to turn my back on them.

Mr. BOEDE. Yes. Well, Senator, we have been for you too.

Senator **Ford**. I understand that.

Mr. **Boede**. So, I can understand what kind of a dilemma you are in. And I think all you have to do is the right thing, and it will solve your dilemma. [Laughter.]

I really believe that.

Senator **Ford**. I understand that, and I will make up my own mind on what is right because I am caught between two entities that have been my friends.

Mr. **Boede**. I understand that.

Senator **Ford**. And I don't think the issues here are false.

Mr. **Boede**. I beg your pardon?

Senator **Ford**. I don't believe the issues that we are talking about are false issues.

Mr. **Boede**. No, I don't believe there are any false issues here today, and I certainly did not come here to get into it with Senator Ford.

But I can tell you this, Senator Ford, that what we are asking for is merely the right to compete. And that is the bottom line, my friend.

Dr. **Leibson**. Senator, I wonder if I could add something to this discussion. Is that permissible, sir?

Senator **Ford**. Yes. You're a doctor. Go ahead. [Laughter.]

Dr. **Leibson**. Thank you, sir.

Senator **Ford**. I'm just a boy from Yellow Creek here trying to get along.

Dr. **Leibson**. Me too, sir.

I think there is another aspect of this that deserves notice, and that is that the country has to increase the amount of domestic coal it uses as a matter of the basic energy dilemma we have confronting us between now and the year 2000.

The projections that have been made by various Government agencies show the coal consumption in this country and production rising to over a billion tons a year from the 825 million tons or so that we are currently producing. All we are talking about for coal slurry pipelines, if all the pipelines we can now visualize were to be built, we would probably not transport more than 50 million or 60 million tons a year. Now, with my arithmetic that leaves a very substantial increase in traffic for the railroads so that I would think with that kind of a likely prospect in front of us no railroad jobs would be lost to coal slurry pipelines because there would be a substantial increase in coal haulage by the railroads necessary just to be able to move the coal that would be additionally produced from the mine to the point of use.

Secondly, please note that the single operating coal slurry pipeline in the United States today is owned by, of all groups, a railroad. Railroads need to consider being transportation companies, not just railroads. The more far-seeing railroads have already diversified into many different areas of endeavor in order to increase the return to their shareholders. It would seem to me that farsighted rail management would recognize the efficiency of coal slurry pipelines and take equity positions in the development of these projects in the national interest and also in the interest of their stockholders. The thing that has made this country great is competition, competition in an open market.

Senator **Ford**. Well, let me just add a couple of things for you to put in your thinking.

One, in my opinion, there will not be a coal slurry pipeline built in the west, that the coal slurry pipelines would be built in the east, and it will be built by a railroad. That's No. 1.

And No. 2, let me ask you your opinion. If the present acid rain legislation before the Senate committee is passed as is, how much coal will be burned without clean coal technologies regardless of whether you have got a coal slurry pipeline or not?

Dr. **Leibson**. Sir, you have hit a nerve with me.

Senator **Ford**. Wonderful.

Dr. **Leibson**. There is no question but if the present acid rain legislation being considered by the Congress is passed, we are headed for a real disaster——

Senator **Ford**. It does not make any difference whether you build a coal slurry pipeline or not.

Dr. **Leibson** [continuing]. For the whole industry, a disaster for the consuming public, a disaster for many areas in the heartland of the United States.

The Congress needs to take the longer view on this issue and provide the money and the time so that the clean coal technologies can be developed. We are talking at a minimum a $50 billion extra cost to convert the coal stations that are now fitted with scrubbers, if this legislation is passed, and an additional $10 billion per year just to operate those scrubbers once they are installed. And that does not begin to count the socioeconomic cost to the country of turning whole areas of the country into economic disaster areas.

So, on the clean coal technology area, we could not be closer together, sir.

Senator **Ford**. Well, we are talking about jobs, and that's the big pitch here today. And it is going to get better. The jobs are not going to be lost; they are going to be increased. Well, let me just say if this bill is passed—and it is closer to being passed today than it has been in a long time. If this bill is passed, then you talk about a loss of jobs and the problems we will have will be tremendous.

I think that if we would put the effort behind clean coal technologies and get ourselves in a position to be able to use that as a defense item, as my good friend has just said, as a defense of this country for the energy that is necessary, if we would do that, that would mean more jobs, more security, more opportunity than a coal slurry pipeline.

In my opinion those who are proposing coal slurry pipelines will never build them. As I say, I believe the railroads will build them before anybody else, and they will run right down their right-of-way.

Dr. **Leibson**. Well, now we believe that the coal slurry pipeline activity is part and parcel of the clean coal technology program. The technology involved does mitigate sulfur emissions, as pointed out in my testimony.

Senator **Ford**. Well, you could wash it before you put it on the barge. You can do a lot of things and create less opportunity for accident.

Mr. Chairman, I have taken too long. But there are a lot of questions that need to be answered for me before I can be for this piece of legislation. If you just want eminent domain, why don't you just give the eminent domain against the railroads and leave it alone for everybody else because I can see it affecting a lot of property that is valuable. You want to take it right down through the thoroughbred industry in central Kentucky. You are going to have one whale of a fight. They are going to pull out machineguns, the National Guard and everything else when you start doing that. [Laughter.]

The CHAIRMAN. We can put an exemption for Churchill Downs.

Senator FORD. It is not Churchill Downs I am talking about. I am talking about some other land.

You know, you talk about natural gas. There is only one source. You could not haul that like you can coal. A lot problems here. And I could argue the case, Mr. Chairman, with you, but I don't want to.

My big problem is what do you do with two warring factions. If one wants such short-term job opportunities, the other is going to lose jobs. So, I think we have got a lot to talk about before this bill ever sees the light of day.

I think my good friend here has just given us the right direction to go as it relates to coal. And if we are going to do that, we ought to get about that business and do it early on instead of trying to get this coal slurry pipeline that happens to be a dream of a few people that I am not sure it is going to be very beneficial to the country.

The CHAIRMAN. Thank you.

Senator Conrad.

Senator CONRAD. Mr. Chairman, witnesses, I would be interested in the total tonnage that is shipped now. You indicated that at the peak coal slurry you might expect 50 million to 60 million tons a year. What is the total amount that is shipped now?

Mr. BOEDE. I don't have those numbers. Do you?

Dr. LEIBSON. I think I can give you a rough estimate. You are saying—let me clarify the question though. You are saying total tonnage of coal shipped by all methods?

Senator CONRAD. Right.

Dr. LEIBSON. Well, there are a very limited number of mine mouth user facilities. I would say that 70 to 80 percent of the coal that is mined is shipped one way or another to point of use in this country. And about 60 percent of the coal shipped by railroads is on long-term contracts. Of course, there are 5 million tons a year being moved now by a coal slurry pipeline.

And I certainly did not mean to say that coal slurry pipelines would peak out at 50 or 60 million tons out of the total coal production. I think it is logical to believe that if Federal right of eminent domain legislation is passed and economic conditions favor this, then within the next 10 to 15 years you'll wind up with 50 or 60 million tons per year being shipped through coal slurry pipelines in this country.

But I think that is just the beginning. I can see a network of coal slurry pipelines developed over the next 50 years. You know, there are new advances in this technology as well that you will hear about later in the morning.

So, I think it is an important area, and it does need to be righted.

Senator **Conrad**. What is the total amount shipped? You are saying 80 percent of——

Dr. **Leibson**. There is about 825 million tons of year of coal currently being produced in the country.

Senator **Conrad**. So, you would be saying 640 million?

Dr. **Leibson**. Roughly. Don't hold me to a precise number.

Senator **Conrad**. No. I am trying to get a range.

And so, I understand you are not suggesting that it would top out at 50 or 60 million tons——

Dr. **Leibson**. No, sir.

Senator **Conrad** [continuing]. That that would be the near term, what you might achieve in the near term.

Dr. **Leibson**. Right, right.

Senator **Conrad**. Let me ask this because I hear the chairman label some of the issues that have been raised by others as baloney, and I certainly understand his right to do that. He is a forceful advocate for his position. And I think it would be very helpful to the committee if at some point the chairman would take a clear and unequivocal stand on this legislation. [Laughter.]

Dr. **Leibson**. I thought he did this morning.

The **Chairman**. I want to give everybody a fair hearing.

Dr. **Leibson**. I thought he did this morning, sir.

Senator **Conrad**. I am interested in the water usage question and the water pollution question. I am not ready to pass judgment that that is a baloney issue or one that does not deserve very serious consideration.

As you know, I come from the State of North Dakota. We have a major source of water behind the Garrison Reservoir which could theoretically be a water source. And we very jealously guard our water prerogatives, as do other States. And I am concerned about the water usage part of this legislation.

Could you tell me if we were at 50 to 60 million tons per year what the acre-feet of water to slurry that would be?

Dr. **Leibson**. I don't have those figures with me this morning, Senator, but I will be glad to see that they are provided to you and to the committee.

Senator **Conrad**. OK. I would be very interested in that.

I am also very interested in the point that you made that there is no problem with current technology in cleaning up this water. And I must say I have my doubts having worked in North Dakota and dealt with the water pollution problems that attend the disturbing of coal veins, coal that is loaded with trace elements, many of those trace elements known carcinogens. I have very serious reservations and questions about the ability to properly dispose of the waste that would be created.

I assume that when you start moving coal in large volumes with water that some of those trace elements, again many of which are carcinogenic, known carcinogens, leach out and have to be disposed of in some way. And I think our history of waste disposal in this country would lead anyone to seriously question how safely that can be done.

I would just be interested in your response.

Dr. **Leibson**. Well, Senator, as we pointed out earlier, the Black Mesa pipeline is operating, has been operating 17 years, has been in total environmental compliance. There is water at the coal slurry preparation facility that is treated before it goes into making up the slurry where the coal is ground at Black Mesa in the preparation plant.

There is water discharge at the Mohave Power Plant of Southern California Edison Co. because there is a dewatering plant there which separates a significant quantity of water out of the slurry. A lot of that water is used in the powerplant itself as cooling water. A small quantity of water is discharged, and those discharges are in compliance with environmental regulatory requirements. And that area is a pristine area.

Senator CONRAD. So, it would have to meet the highest standard then——

Dr. LEIBSON. Yes, sir.

Senator CONRAD [continuing]. Of EPA.

Dr. LEIBSON. Yes, sir. Senator Conrad: Well, that would give me comfort if I had confidence in the standards set by EPA.

Grain rates. Let me just ask you the effect on grain rates. Obviously a good deal of the coal now moves by rail. To the extent that you take traffic off a rail line, that reduces revenue to that rail line which also is a major grain hauler. And in my part of the country, those are obviously two of the key commodities.

To the extent that you reduce revenue going to that rail line, don't you increase pressure on the other commodities that are hauled by that line? In other words, by reducing the throughput of a line that is currently dedicated to coal hauling, that provides a revenue stream to that company. You diminish that revenue stream. That puts greater pressure on grain haulers.

I would be interested in your reaction to that.

Dr. LEIBSON. Well, as we pointed out again earlier, we do not see that happening because the rate of coal consumption in the United States and production has been increasing. And we see it increasing further during the next 10 years to well over a billion tons per year. And we believe that there will be enough requirements for rail haulage of coal so that there will be essentially no reduction in railroad overall haulage of coal. In fact, we see an increase because I don't think we can build enough coal slurry pipelines fast enough to absorb the total increase that is anticipated in coal production.

Senator CONRAD. I understand what you are saying. You are saying coal hauling is going to go up and, therefore, there is not going to be a reduction to rail.

But my question is really a different question. My question is, Don't, to whatever extent, you have traffic moving off of the rails into a coal slurry? Aren't you increasing the pressure on those who remain as haulers on that line?

Dr. LEIBSON. Let me explain the thing another way in economic terms.

Statistics are not available to define the fixed costs associated with rail investment as opposed to their variable costs. Now, the railroads have been operating for many years. Their capital expenditure rates for new equipment are really not all that high compared to other industries. I would guess—and it is purely a guess on my part. Our railroad brethren probably are more well-informed here than I am. But I would guess that much of that investment has been depreciated. And so, when you look at their actual cost structure, if you are in a railroad, what you are really talking about having an effect on here is their variable cost. If the railroad does not run, they don't spend the money for the fuel. They don't spend other moneys that are a part of that variable cost base.

If variable costs are reduced, depending on what their profitability is on the extra haulage. That certainly would determine what effect there would be on their earnings. But as I stated earlier, we don't see that as a particular problem because coal usage is increasing and is projected to increase substantially between now and the end of the century.

I don't believe their cost structure has ever been made public in any documents I am familiar with, sir.

Senator **Conrad**. Wouldn't you be surprised though, as a business proposition, that a company that loses traffic and therefore loses revenue, certainly cannot be strengthened by what is proposed here?

Dr. **Leibson**. I would think if transportation via slurry is a more economic approach and if the pipeline can be justified in the first place, and if I were running that company, I would want to climb aboard and own the pipeline because in the final analysis the most economic alternative is the thing that has to prevail. Otherwise, we have an inflationary climate that is to the detriment of all the consumers in the public and to everyone else in the country, particularly since the railroad industry is now deregulated. So, any forward-looking executive ought to be looking at new investment opportunities, and certainly this would be one.

Senator **Conrad**. Yes, I certainly understand your argument on that score.

I still remain concerned that those haulers that are, for example, moving through my part of the country that are now heavily involved in both commodities, grain and coal, to the extent that you reduce their coal haulage, you put additional pressure on those shippers that remain behind. I really know of no economic principle that would not lead you to that conclusion.

Mr. **Boede**. Except that we have not agreed to your concept that coal slurry is going to reduce coal haulage by the railroads. In fact, we say just exactly opposite. I am not an economist and your theory may very well be correct, but the basis on which you are putting forth your theory is a shaky one at best. This is not going to happen in our estimation. The coal consumption is just going to be added to the coal haulage. And there is going to be as much coal hauled in this country after the construction of coal slurry than there was before by virtue of the very competitive aspect that coal slurry piping will create.

Senator **Conrad**. But certainly you cannot suggest that the presence of coal slurry is not going to reduce the amount of traffic that goes by rail over what it would otherwise have been. Certainly there is x amount of shipping that goes on via the rails. If you have coal slurry, it is going to be x minus something.

Mr. **Boede**. Yes, but what you are really saying, Senator, as I understand it then, is that in the event we did not have coal slurry, and this exportation of coal took place, and the additional use of coal took place which we say is not going to happen unless we have competition—you are saying if that did happen without this competition, the railroad would haul it all and consequently I could haul my grain even cheaper. Is that what you are saying?

Senator **CONRAD**. No. What I hear you saying is that the entire increment, whatever goes to coal slurry is going to go to export, would not have been hauled by the rails in any event. Is that what you are suggesting?

Mr. **BOEDE**. No, I am not suggesting that at all. I am suggesting the theory—and I guess you were not here when I went through this gyration of the smaller pie and the larger pie. And what we are merely saying is that presently the railroads probably—and I am not sure about these numbers, but it is well in the 90 percent of the coal that is moved in the country is moved by rail. Well, 90 percent of a small pie could very well be less ton miles than 75 or 80 percent of a much larger pie.

Senator **CONRAD**. But then what you are suggesting is the entire——

The **CHAIRMAN**. Can we summarize this quickly? We have got another six witnesses.

Senator **CONRAD**. Yes. Let me conclude this by saying what I hear you suggesting is precisely what I said earlier that the entire increment, the entire addition, will be going to a market that does not now exist, going into export. And that must be your point; otherwise, you are reducing what would otherwise go to the rails.

Mr. **BOEDE**. Well, not completely to export. May I, Mr. Chairman?

The **CHAIRMAN**. If you can summarize very quickly.

Mr. **BOEDE**. I can summarize very quickly.

The **CHAIRMAN**. I've got six witnesses. I've got a vote at 11.

Mr. **BOEDE**. We are not saying that at all. We are saying that competition is going to create increased use of coal in this country, and it is also going to enable us to export coal.

Senator **CONRAD**. Thank you.

The **CHAIRMAN**. Thank you Senator Conrad.

[Subsequent to the hearing Dr. Leibson submitted the following:]

STA Slurry Technology Association

1800 Connecticut Avenue NW • Washington, DC 20009 • (202) 332-5751

October 5, 1987

The Honorable J. Bennett Johnston
Chairman
Committee on Energy and Natural
  Resources of the U.S. Senate
364 Dirksen Office Building
Washington, DC 20515

Dear Mr. Chairman:

I am responding for the hearing record to your question at the September 10th hearings on coal pipeline legislation.

It was asked if there were technological protections in place for water discharge from coal slurry pipelines. At the terminus of a slurry pipeline, the slurry is delivered into agitated tank storage, from which it is fed into a dewatering facility. Advanced dewatering systems for conventional coal water slurry mixtures are essentially closed circuit systems to achieve the highest recovery rate of the coal. Centrifuges first separate the coal from the water, resulting in a coal cake that is sent to belt filter presses. Remaining filter press solids go back to the dryers and remaining coal fines go to clariflocculators for chemical separation. Fines still remaining after the clarifying process are sent back to the belt filter to close the circuit.

After the product is dewatered, the coal is dried for open on-site storage, transferred to other modes of transportation for further transport, or introduced directly into an on-site-pulverizer and then injected into a boiler. The water reclaimed from the slurry normally will be used as make-up water in an electric generating station's cooling system. A utility's cooling system is a closed loop circulating water system used to condense steam. As the water evaporates in the system -- which operates much the way a steam kettle works -- a small amount of make-up water is required. In the case of the proposed Baltimore Gas & Electric pipeline, their daily requirements for make-up water, averaging 2.4 percent of the circulating water flow rate of their system, could be supplied by pipeline water. For systems designed for discharge, the reclaimed water is cleaned to federal, state and local standards, using proven industrial and municipal wastewater technology.

dedicated to the advancement of pipeline delivery
of solids and direct firing of coal-liquid mixtures

Coal-water fuel pipeline systems transport direct-fired mixtures consisting of finely ground coal and water mixed to the overall consistency of latex paint. After free sulfur and debris are dislodged from coal by finely grinding it and washing it, the coal water fuels are transported long distances by underground pipelines. Requiring no dewatering and no further pulverization, these coal-rich fuels are fired directly like residual fuel oil into a boiler.

This approach will be utilized in the slurry fuels pipeline which is under construction now in the Soviet Union. When completed in 1988, it will have a capacity of approximately 4,500,000 metric tons/year of coal-water fuel which will contain 3,000,000 metric tons of dry coal. The coal-water fuel will be pumped through a 20" diameter underground pipeline over a distance of 160 miles from Belovo to Novosibirsk. By contrast to the design of conventional coal pipeline systems, coal fuel pipeline systems require almost 60 percent less water usage than conventional mixtures, and obviate the need for agitator tank storage, dewatering facilities and pulverizers at end-user sites.

Finally, I am enclosing technical papers presented at the Eighth International Technical Conference on Slurry Transportation that detail the procedures that would have been used to treat the slurry wastewater for the ETSI Pipeline Project.

I trust that this answers your question on the ability of industry to properly treat and dispose of the wastewater from coal pipelines. If I can provide any additional information, I will be pleased to do so. Again, I appreciated the opportunity to appear before your committee.

Sincerely yours,

THE SLURRY TECHNOLOGY ASSOCIATION

I. Leibson

I. Leibson
Chairman of the Board

Attachments

THE ETSI COAL EVALUATION PLANT WASTEWATER CHARACTERIZATION STUDY

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Alan Plummer and Associates, Inc.

and

Ron H. Derammelaere and Avtar S. Sandhu

ETSI Pipeline Project

U.S.A.

INTRODUCTION

The ETSI Pipeline Project, A Joint Venture (ETSI) designed and constructed a 50-ton per hour coal slurry preparation and dewatering plant at the Arkansas Power and Light Company (AP&L) White Bluff Steam Electric Generating Station located near Redfield, Arkansas. The coal evaluation plant (CEP) consisted of full-scale equipment to be used in commercial coal slurry preparation plants and full-scale equipment representing a typical module from a coal dewatering facility. A schematic of the CEP system is shown in Figure 1. The major purpose of this CEP was to demonstrate the effectiveness of the equipment and to develop detailed design information for the commercial plants.

In conjunction with the CEP project, ETSI also performed extensive wastewater characterization studies during January through April, 1982. The original purpose of these studies was to verify data previously developed by several investigators and in ETSI laboratory simulation and bench-scale studies and to further develop wastewater treatability information. The primary uses of this information included:

- providing technical support for applications for state and NPDES discharge permits; and
- providing information relevant to the design of wastewater treatment facilities at the coal dewatering plants.

COAL EVALUATION PLANT WASTEWATER CHARACTERIZATION STUDY

Description

As stated above, the ETSI CEP consisted of both coal slurry preparation and dewatering systems. Jacobs Ranch coal and AP&L service water were typically used to prepare slurry. Water quality characteristics for the Oahe Reservoir and AP&L service water are presented in Tables 1 and 2, respectively. Additional coals tested included North Rawhide and Black Thunder.

Initially, the wastewater characterization study focused on dewatering process streams. However, the program expanded to include coal slurry preparation units as the study progressed. Sampling locations are identified on Figure 1. Samples collected throughout the CEP were filtered through a Whatman 1 filter paper prior to delivery to a commercial laboratory for analysis. The samples were filtered to reduce coal concentrations to levels consistent with concentrations projected for thickener overflow. For soluble constituent analyses, the samples were filtered at the commercial laboratory through a 0.45μ membrane filter. All laboratory analyses were conducted in accordance with procedures established in *Standard Methods for the Examination of Water and Wastewater*.

Because one of the primary objectives of the wastewater characterization study was to develop information to support state and NPDES discharge permit applications, the study focused on those constituents of concern to the regulatory agencies. Primary constituents measured included:

- organics (BOD, COD, TOC);
- inorganics;
- metals; and
- priority pollutants.

Results and Discussion

Organic Constituents. The organic constituents were measured in terms of biochemical oxygen demand (BOD), chemical oxygen demand (COD), and total organic carbon (TOC). The concentration of BOD, in the

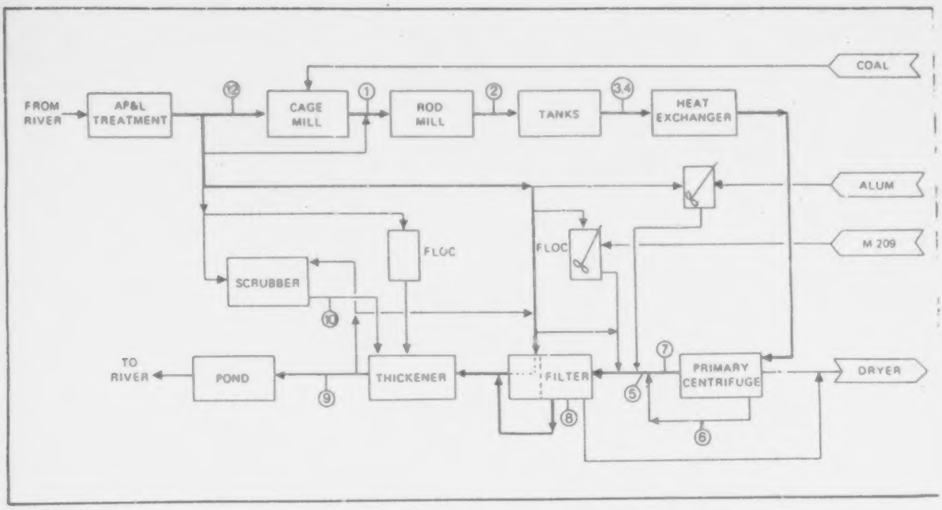
FROM RIVER
AP&L TREATMENT
⑫
CAGE MILL
①
ROD MILL
②
TANKS
3,4
HEAT EXCHANGER
COAL
ALUM
M 209
FLOC
FLOC
SCRUBBER
⑩
TO RIVER
POND
⑨
THICKENER
FILTER
⑧
⑤
⑦
PRIMARY CENTRIFUGE
⑥
DRYER

Figure 1. CEP Coal Slurry Preparation and Dewatering System Schematic and Associated Sampling Locations

Figure 1.
Sampling Location Legend

Sampling Point No.	Code	Description
1	CMP*	Cage Mill Product (wet)
2	RMP*	Rod Mill Product—collected after screen (when operating), otherwise after rod mill.
3	PF*	Primary Feed—pipeline specification slurry before heat exchangers. Called primary feed because it was going to the primary centrifuge for dewatering.
4	PF(H)*	Primary Feed—same as 3 except heated to 180°F in laboratory.
5	PEC*	Primary Effluent Combined—primary centrifuge centrate and screen bowl drainage combined.
6	SBD*	Screen Bowl Drainage—from primary centrifuge.
7	PC*	Primary Centrifuge Centrate
8	AG*	Andritz Gravity—effluent from gravity belt filter at beginning of CEP belt press. Frequently used as effluent sample because subsequent sample point diluted with service water.
9	TO	Thickener Overflow—frequently diluted with belt wash water and wet scrubber water.
10	WS*	Wet Scrubber—samples collected from wet scrubber underflow sump.
11	SC*	Secondary Centrifuge—samples collected from secondary centrifuge effluent sump.
12	SW	Service Water—AP&L service water consisting of Arkansas River water which had settled in holding ponds.

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*Samples were filtered through Whatman 1 filter paper prior to delivery to the lab to reduce the solids concentrations to levels approximating thickener overflow concentrations (< 60 mg/l).

TABLE 1

OAHE RESERVOIR WATER QUALITY CHARACTERISTICS

Parameter	Missouri River at Pierre, SD USGS Sta. No. 06440000[1] Average (mg/l)	Range (mg/l)	No. of Samples	Lake Oahe Near Pollock, SD[2] Average (mg/l)	Range (mg/l)	No. of Samples
Calcium	49	< 1–65	113	58	48–60	10
Magnesium	20	< 1–26	113	24	18–28	10
Sodium	83	56–240	113	71	38–94	14
Sulfates	205	170–250	113	191	99–245	17
Chlorides	10	8–16	113	9	2–11	17
Alkalinity (as $CaCO_3$)	157	126–178	103	161	100–181	18
Total Dissolved Solids	482	433–602	60	491	308–616	17

[1] Water Resources Data for South Dakota. USGS Station No. 06440000, Missouri River at Pierre, SD Water Years 1974–1980.

[2] Water Resources Data for South Dakota. USGS Water-Data Report SD-80-1. Water Year 1980.

coal slurry dewatering effluent was projected to be in the 80 to 165 mg/l range for slurries prepared with Kerr-McGee (Jacobs Ranch) coals. At the CEP, initial results of analyses on primary centrifuge feed, primary centrifuge effluent, and screen bowl drainage filtrates indicated soluble BOD_5 concentrations less than 20 mg/l, and soluble COD concentrations less than 50 mg/l. Subsequent analyses at these and additional sampling locations supported the initial CEP sampling results.

As shown in Table 3, average and maximum BOD_5 concentrations were consistently less than 30 mg/l. The accuracy of the low BOD concentration is supported by low TOC and COD concentrations. The thickener overflow concentrations were significantly less than those measured in other process streams due to dilution by service water used as belt wash and wet scrubber water. The belt press gravity belt effluent, thus, more accurately represents the final effluent organics' concentration.

TABLE 2

AP&L SERVICE WATER QUALITY[1]

Parameter[2]	Average (mg/l)	Range (mg/l)	Number of Observations
pH	—	7.2-8.300	100
Conductivity	690	490–820	100
Dissolved Solids	354	130–544	50
Hardness	122	80–180	57
$CaCO_3$ Hardness	79	50–100	51
M Alkalinity	53	39–69	49
Chlorides	110	56–200	97
Silica	3.39	1.49–4.93	48
Phosphate	0.15	0.04–0.32	99
Sulfate	82	53–110	99
Iron	0.416	0.067–0.84	4
Copper	0.099	0.02–0.212	4
Sodium	90	35–180	99

[1] Source: 1981-1982 AP&L White Bluff Daily Water Report Data

[2] All units mg/l except pH (standard units) and conductivity (micromhus/cm)

Table 3 also shows the similarity between the organics concentrations measured in the various process streams. This similarity indicates that the dewatering process does not significantly impact the organics in the dewatering effluent.

— *Inorganic Constituents.* The projected inorganic concentrations in the dewatering effluents are particularly important because numerical water quality criteria have been established by state regulatory agencies for total dissolved solids, sulfates, and chlorides in the receiving streams at the proposed ETSI dewatering plant sites. Inorganics' concentrations ranges observed at the CEP are presented in Table 4.

The sulfates and dissolved solids concentrations in the CEP dewatering effluent samples were significantly impacted by the addition of alum or sulfuric acid to reduce the slurry pH and improve dewatering. Measurements made on primary feed (without chemicals) were within the ranges measured during simulation studies. Maximum primary feed sulfate and TDS concentrations were, however, lower than the maximums measured during simulation tests. The concentrations in the dewatering effluent will depend upon the choice and dosage of chemicals added to the dewatering system. Figure 2 shows the percentile plots of sulfates and total dissolved solids concentrations. As is shown by the plots, concentrations for sulfates and TDS varied significantly due to the testing of different additive combinations.

Chlorides concentrations in dewatering effluent were closely related to source water chlorides concentrations. The average chlorides concentration in AP&L service water was 110 mg/l (based on AP&L monitoring data).

TABLE 3

SUMMARY OF ORGANICS' CONCENTRATIONS MEASURED IN CEP SAMPLES

		BOD$_5$ (soluble)				COD (soluble)				TOC (soluble)			
Sample Location[1]	**Description**	**Avg. mg/l**	**Min. mg/l**	**Max. mg/l**	**No. of Samples**	**Avg. mg/l**	**Min. mg/l**	**Max. mg/l**	**No. of Samples**	**Avg. mg/l**	**Min. mg/l**	**Max. mg/l**	**No. of Samples**
1	Cage Mill Product[2]	4			1	39	14	58	7	12	8	31	7
2	Rod Mill Product[2]	8	5	11	3	31	14	64	8	11	7	28	7
3	Centrifuge Feed (unheated)[2]	12	5	21	16	45	14	137	23	12	7	26	6
4	Centrifuge Feed (heated)[2,3]	15	7	22	5	67	40	134	9	27	21	41	9
5	Centrifuge Effluent (combined)[2]	9	4	14	16	37	13	86	24	13	3	32	14
8	Belt Press Effluent (Andritz Gravity)[2]	7	4	11	8	47	18	102	11	12	7	17	11
9	Thickener Overflow[4]	3	< 1	6	9	24	9	43	13	4	3	8	10
12	Service Water	3	< 1	6	9	19	5	46	20	5	3	14	12

[1] See Figure 1

[2] Filtered Whatman 1 prior to delivery to Sorrells Research Laboratory

[3] Heated in the laboratory

[4] Significantly diluted with service water used as belt wash and wet scrubber water

The average chloride concentrations in primary feed filtrates and belt press effluent filtrates were 92 mg/l and 82 mg/l, respectively.

Both alum and sulfuric acid reduce alkalinity. Thus, the low alkalinities measured in the belt press effluent and thickener overflow samples result from the addition of alum or sulfuric acid for pH control.

Metals. A summary of the CEP belt press effluent samples' metals concentrations as compared to state effluent standards is presented in Table 5. Results of tests

TABLE 4

INORGANICS CONCENTRATIONS IN ETSI COAL SLURRY DEWATERING PROCESS WASTEWATER[1]

Parameter[2]	**Service Water[3]**	**Primary Centrifuge Feed[4]**	**Belt Press Effluent[4,5]**	**Thickener Overflow[4,5]**
Calcium		22–43	50–177	41–125
Magnesium		6–12	14–45	12–22
Sodium	35–180	113–169	16–325	9–175
Sulfates	53–110	65–338	368–1300	240–1390
Chlorides	56–200	65–193	62–141	48–87
Alkalinity (as $CaCO_3$)	39–69	24–92	< 1-38	< 1-2
Total Dissolved Solids	130–544	29–1180	967–2350	566–1670
Conductivity	490–820	550–1300	810–2370	830–1780

[1] Based on CEP samples analyses

[2] All units mg/l except conductivity (umhos/cm)

[3] AP&L Monitoring Program. September 22, 1981, through March 10, 1982

[4] CEP samples February–April, 1982

[5] Belt press effluent samples collected at gravity belt filter section of belt press. Belt press effluent samples more representative of final effluent quality than thickener overflow due to dilution of thickener overflow with service water used as belt wash and wet scrubber water

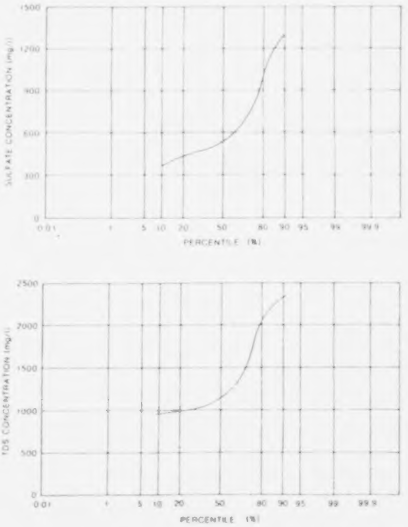

Figure 2. Percentile Distribution of Belt Press Effluent Sulfate and TDS Concentrations

TABLE 5

METALS ANALYSES ON CEP SAMPLES

Parameter	Effluent Limitations Arkansas	Effluent Limitations Oklahoma	Belt Press Effluent Metal Concentration Average (mg/l)
Arsenic	50	200	< 2.5
Barium	5,000	—	932
Boron	1,000	1,000	331
Cadmium	20	30	5.5
Chromium	500	100	8.5
Cobalt	—	1,000	28
Copper	200	100	8.6
Cyanide	50	25	< 13.5
Lead	100	100	57
Manganese	1,000	200	54
Mercury	5	5	< 0.2
Nickel	800	1,000	31
Selenium	20	50	< 20
Silver	100	100	< 2.3
Zinc	500	1,000	52

on the samples from the belt press are presented since its effluent is representative of the commerical plant discharge. As shown in the table, the average CEP wastewater metal concentrations were well within the state effluent standards.

Priority Pollutants. In connection with the wastewater characterization study at the CEP, several samples were analyzed for the full spectrum of the 129 constituents classified by the EPA as priority pollutants. Results indicate that, with the exception of low concentrations of some metals as discussed above, the ETSI wastewater contained no priority pollutants. The results also confirmed previous analyses performed in conjunction with the coal slurry transport simulation studies.

Summary

Analyses of the samples measured at the ETSI CEP indicate that the coal dewatering effluent quality will be as shown in Table 6. The low BOD_5 concentrations preclude the need for expensive biological treatment at the dewatering plants. After reduction of suspended solids, neutralization will be the only treatment necessary to comply with projected EPA and state effluent limitations. Effluent metals concentrations do not exceed state effluent limitations. With the exception of low levels of heavy metals, the coal slurry dewatering effluent does not contain priority pollutants.

COAL EVALUATION PLANT SPECIAL STUDIES

In addition to the wastewater characterization study, several special studies were performed at the CEP. Special studies included the following:

TABLE 6

PROJECTED WATER QUALTIY CHARACTERISTICS OF COAL SLURRY DEWATERING EFFLUENT

Parameter	Projected Average Concentration
BOD_5 (mg/l)	≤ 30
TSS (mg/l) (after clarification)	30
pH (after neutralization)	6–9
TDS (mg/l)	2000
SO_4 (mg/l)	1200
Cl (mg/l)	< 20
Heavy Metals	< state effluent limitations
Priority Pollutants (excluding metals)	< detection limits

- coal washing: to determine whether the final constituent concentrations in the coal dewatering effluent were a function of the grinding/preparation process or a surface washing phenomenon;
- coal prehistory: to determine the impact that coal prehistory (before slurrying) has on coal dewatering effluent quality; and
- coal/water contact time: to verify information previously developed that the coal/water contact time did not significantly impact the coal dewatering effluent quality.

Coal Washing

To determine whether the final constituent concentrations in dewatering effluent were a function of the grinding process or a surface washing phenomenon, cage mill feed (2" × 0 coal) was collected at the same time as samples throughout the plant. A slurry was prepared using this coal and rolled in the laboratory in slurry transport simulation units for one hour. The procedure was repeated on three different days using two different coals. Results of tests performed on the simulated slurry (2" × 0 coal) were compared with results of tests performed on actual coal slurry (Table 7).

Test results demonstrated that the organics (i.e., BOD_5) concentrations present at the beginning of the CEP coal slurry preparation process as measured in cage mill product filtrates were essentially the same as those at the end of the coal slurry dewatering process as measured by the belt press filtrates. Inorganic concentrations increased after slurry preparation but were similar between cage mill product, rod mill product, and centrifuge feed filtrates. Inorganic concentrations measured after the centrifuge are dependent upon the types and amounts of chemical additives used to enhance dewatering performance. (i.e., sulfate and TDS concentrations increase with addition of alum or sulfuric acid.)

TABLE 7

COAL WASHING STUDY DATA

Date[1]	Sampling Point	TOC (mg/l)	COD (mg/l)	pH	COND. (umhos/cm)	SO_4 (mg/l)
4/25	Cage Mill Feed Slurry 1	9	58	7.08	440	178
4/25	Cage Mill Feed Slurry 2	9	58	6.86	450	196
4/25	Cage Mill Product	8	55	7.24	700	267
4/25	Rod Mill Product	8	64	7.26	780	267
4/25	Centrifuge Feed	9	69	7.34	780	256
4/25	Centrifuge Effluent[2]	10	70	6.83	1350	747
4/25	Belt Press Effluent[2,3]	14	72	6.44	995	605
4/26	Cage Mill Feed	8	58	7.52		
4/26	Centrifuge Effluent[2]	3	46	7.51	1100	427
4/26	Belt Press Effluent[2,3]	10	62	7.07	810	480
4/27	Cage Mill Feed	13	61	7.4	290	28
4/27	Cage Mill Product	10	44	7.45		
4/27	Centrifuge Feed	9	48	7.96	640	
4/27	Belt Press Effluent[2,3] 10:45 am	13	53	6.27	2370	1300
4/27	Belt Press Effluent[2,3] 11:45 am	9	37	6.43	2230	

[1] North Rawhide coal on 4/25. Jacobs Ranch coal on 4/26 and 4/27

[2] Includes alum.

[3] Belt press effluent from gravity belt filter section

Thus, the TOC and COD results for filtrates from the coal washing study indicate that the organics present in the coal dewatering effluent were essentially a coal surface washing phenomenon similar to that which occurs during slurry preparation and dewatering and not impacted by the coal slurry preparation or dewatering processes. Inorganics concentrations increase during coal slurry preparation but remain relatively constant after the initial grinding.

Coal Prehistory

Results of the simulation studies, as well as special studies performed at the CEP, indicate that the history of the coal before slurry preparation plays a significant role in determining coal slurry dewatering effluent quality. The results of tests performed on slurries from several simulation investigations using a single coal over a 66-week period are presented in Figure 3 for sulfates and COD. As shown by the curves, both sulfate and COD increased over time. A review of other organic and inorganic constituents, including BOD, TOC, TDS, and chlorides, indicated that each increased with increasing coal storage time except chlorides. In both simulation studies and CEP studies, chlorides proved to be a function of source water concentrations and independent of coal source or conditions.

In addition to the slurry simulation test data, information was developed by a controlled environment study (Odasz, 1982) at the CEP. Fresh minus 4 mesh coal was placed in constant temperature environments (32°F, 85°F, and 100°F). At predetermined times, coal samples were removed from the controlled environments and used to prepare slurries. The slurries were rolled for 3 days in slurry simulation units and then filtered through Whatman 1 filter paper prior to delivery to a commercial laboratory for analyses.

Odasz's study results verified the relationship between coal dewatering effluent quality and coal storage time/temperature as shown in Figures 4 and 5. The controlled environment study also showed that coal storage tem-

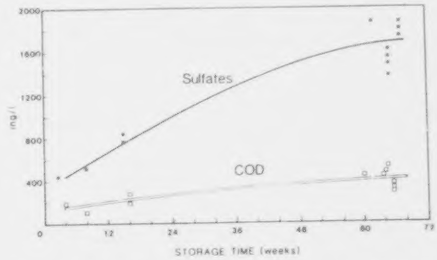

Figure 3. Sulfate and COD Concentration Variation with Storage Time

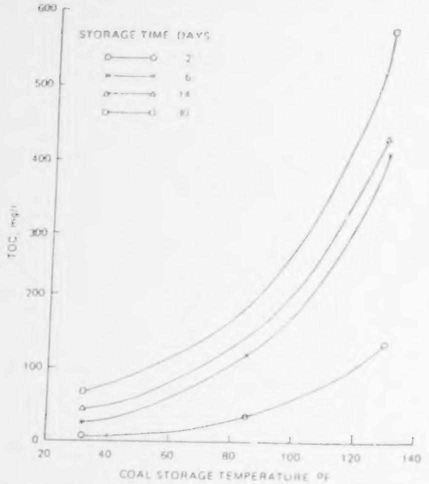

Figure 4. TOC in Slurry Filtrate Relative to Coal Storage Time and Temperature

peratures could significantly impact the final filtrate quality as illustrated in Figure 4. As shown by the data presented in Figure 4, organics concentrations increase significantly with coal storage time and the phenomenon is enhanced at elevated temperatures.

Coal/Water Contact Time

Special studies performed at the CEP verified previous findings that coal/water contact time (i.e., pipeline transport time) does not significantly impact effluent quality. For these studies, three CEP rod mill product samples were collected in conjunction with routine sampling activities. The first of the three samples was immediately filtered at the CEP and its filtrate delivered to Sorrells Research Laboratory for analysis. The remaining samples were placed in pipeline transport simulation containers similar to those used in slurry simulation tests. The containers were rotated at the CEP for specified periods of time before the sample was removed, filtered, and delivered to the laboratory for analysis. Typically, one sample was rotated for three to four days, the other rotated for 12–13 days. Results of analyses on roll-test filtrates are displayed in Table 8.

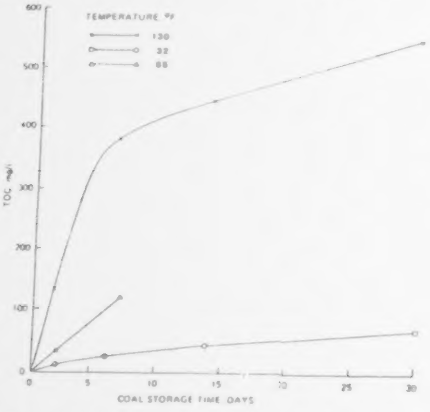

Figure 5. TOC in Slurry Filtrate Relative to Coal Storage Time and Temperature

This testing program evaluated coal/water contact time impacts using two Jacobs Ranch slurry samples, one Black Thunder sample, and one North Rawhide sample. As in previous studies, with the exception of alkalinity, the data demonstrate no significant correlation between coal/water contact time and slurry filtrate quality. As shown in Figure 6, there was a definite increase in alkalinity with increased coal/water contact time.

SUMMARY AND CONCLUSIONS

- From August 1981 through April 1982, ETSI conducted an extensive CEP study. The pilot plant study consisted of evaluating full-scale coal slurry preparation and dewatering equipment to optimize unit processes. In addition to the equipment and process optimization study, a wastewater characterization study was conducted to develop information to support EPA and state discharge permit applications. Results from the CEP charac-

TABLE 8

CEP ROLL TEST FILTRATE QUALITY DATA

Coal	Sample Collection Date	Roll Time[1] (Days)	Soluble TOC[2] mg/l	Soluble BOD_5 mg/l	TDS mg/l	pH	Alk. mg/l
Jacobs Ranch	4/15/82	0	9.5	7.5	495	7.94	104
		4	10	6.2	634	7.62	168
		13	7.9	6.6	601	7.90	222
Jacobs Ranch	4/24/82	0	8.5	—	487	7.55	—
		4	13	—	—	7.80	—
		12	12	—	—	8.36	—
Black Thunder	4/21/82	0	28	—	443	6.25	20
		3	28	15.4	460	7.20	66
		13	13; 11	3.7	468	7.49	164
North Rawhide	4/25/82	0	8.3	4.8	615	7.26	48
		3	13	9.4	725	7.52	124
		12	8.7	6.4	791	7.51	248

[1] Time 0 = rod mill product filtered immediately after collection. Other rod mill product samples were rolled in simulation units for the time specified.

[2] Semicolons divide concentrations measured in duplicate.

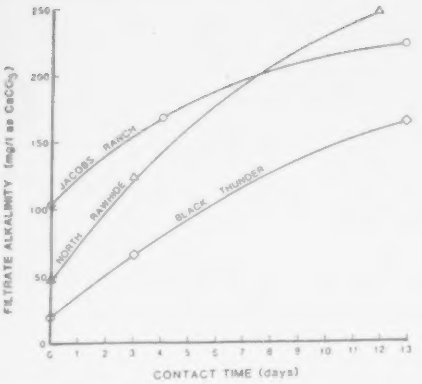

Figure 6. Filtrate Alkalinity as a Function of Slurry Contact Time

terization study can be used to project coal slurry dewatering effluent quality.

- Results from the CEP wastewater characterization study indicate that the average BOD_5 in the coal slurry dewatering plant wastewater will be less than 30 mg/l. Based on operating conditions at the CEP representing full-scale operations, BOD_5 reduction systems will not be required at the ETSI coal slurry dewatering plants.
- Analyses of coal slurry filtrates prepared using the 2" × 0 coal supplied to the cage mill and results of sample filtrates from throughout the dewatering system indicate that the organics (i.e., BOD_5) in the dewatering plant wastewater are a function of the history of the coal (i.e., storage time and temperature) and are not affected by the coal slurry preparation or dewatering processes.
- Differences between the organic concentrations projected based on previously performed slurry transport simulation studies and those based on the CEP wastewater characterization studies appear to have resulted from the coal storage and handling procedures unique to the laboratory study.
- The inorganic concentrations in the coal slurry dewatering effluent are primarily a function of the chemicals added during the dewatering process and the inorganic constituent concentrations in the slurry source water and coal.
- With the exception of low concentrations of metals, the coal slurry dewatering plant wastewater does not contain detectable concentrations of priority pollutants.
- As indicated during the slurry transport simulation studies and confirmed during the CEP wastewater characterization study, coal slurry transport time (i.e., coal/water contact time) does not significantly impact the effluent constituents which are of concern to permitting agencies. Alkalinity, however, did increase with contact time. The only treatment that will generally be required for the coal slurry dewatering discharge is suspended solids reduction and pH neutralization.

MECHANICAL DEWATERING, THERMAL DRYING, AND DUST COLLECTION: AN INTEGRATED APPROACH

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INTRODUCTION

ETSI successfully concluded the operation of its Coal Evaluation Plant (CEP) test facility in April 1982. These facilities, located at Arkansas Power and Light's White Bluff Power Plant near Little Rock, produced pipeline slurry, and dewatered and dried the slurry to a specification cake which was stockpiled in the power plant's coal yard. A description of the CEP and an interim report on the tests conducted was presented at the Seventh International Technical Conference on Slurry Transportation in March, 1982.[1]

Preparation of the slurry, and the storage and handling of dewatered coal, were the subject of two other papers at the Eighth International Technical Conference on Slurry Transportation.[2,3] This presentation focuses on the dewatering facilities at the CEP and the optimization of the variables of the dewatering process.

DEWATERING PROCESS

The CEP throughput capacity was dictated by the largest commercially proven dewatering equipment, i.e., a 50-ton per hour screenbowl centifuge that is 44-inches in diameter and 132-inches long. The centrifuge is followed by a vibrating bed dryer that is 5-feet wide and 40-feet long. This was to represent a typical module in the commercial dewatering plant.

INITIAL OBJECTIVES OF THE TEST WERE TO:

- Demonstrate the operation of a full scale centrifuge and vibrating bed dryer
- Test the solid bowl centrifuge and alternative filtration-type equipment to determine the most effective approach to deal with the effluent from the screenbowl centrifuge
- Test and select types and dosages of flocculants and other chemicals needed in the various steps of the dewatering process
- Determine the solids carry-over in the vibrating bed dryer and assess the effectiveness of dust control equipment in meeting environmental standards
- Demonstrate that the dewatering circuit can be closed, i.e., no fines are rejected

The ultimate objective was to optimize the variables of the selected process for a cost effective commercial flow sheet. The following flowsheet (Figure 1) illustrates the major components in the dewatering process:

- Mechanical dewatering
  —Primary: centrifuge
  —Secondary: belt filter
- Thermal drying

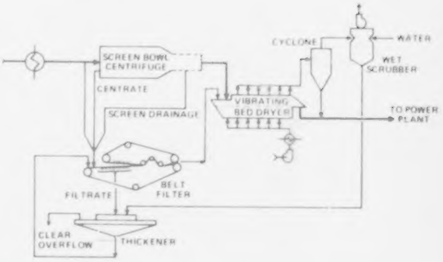


Figure 1. Dewatering Process Flowsheet

At a solids concentration of approximately 54 percent, the slurry is dewatered in a screenbowl centrifuge. The effluent from the centrifuge, mostly fine material and consisting of 5 to 25 percent of the incoming feed, is processed through a belt filter. The wet cake from this secondary dewatering operation is combined with the primary moist cake and dried over a vibrating bed dryer to the ultimate specification product: a dry cake with approximately ten percent surface moisture. Two manufacturers, KHD and Bird, offered their commercial size, 500-hp centrifuge for testing (Figure 2). The 2.2-m wide belt filter (Figure 3) was flown in from Europe by Andritz, and the vibrating bed dryer was manufactured on the east coast by Jeffrey Manufacturing (Figure 4).

CENTRIFUGE OPERATION

Centrifugal force is used to separate solids from water. In the cylindrical and conical sectons, settling of the solids is accelerated under high "g" forces (approximately 600 times gravity). The screw conveyor moves the sediment onto the "beach" and over the screen drum section of the centrifuge. Again, centrifugal forces aid further dewatering by extruding water from the wet cake. The resulting surface moisture of the centrifuge cake at the CEP is from 12 to 13 percent (Figure 5).

Several variables affect the centrifuge performance. The dependent variables of significance to optimizing the process are moisture of cake and recovery, i.e., cake discharge expressed as a percent of feed. The independent variables are:

- Screen drainage recycle
- Feed temperature (T) (ambient—200°F)
- Feed fines, percent minus 325 mesh (F) (20-26 percent)
- Feed solids concentration (C) (54-60 percent)
- Feed rate (Q) (30-50 tph)

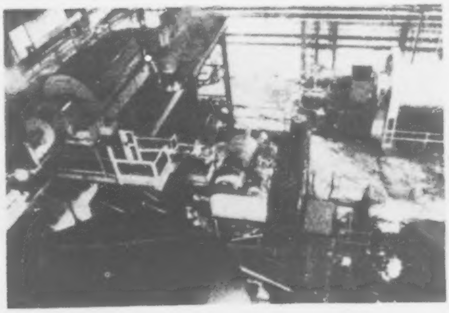


Figure 2. Centrifuge

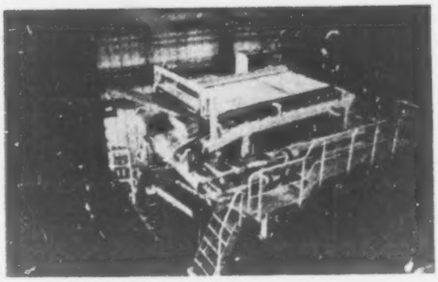


Figure 3. Belt Filter

- Bowl speed (S) (800-1300 rpm)
- Pool depth (P) (3-5")

Tests were conducted to determine the effect of screen drain recycle (Figure 6). While cake moisture is increased by almost three percentage points as a result of the recycle, recovery is dramatically improved. In isolation from the other parts of the process, it is not possible to derive the optimum condition from this test data. It is necessary to know to what degree the secondary dewatering equipment is enhanced by the coarser material in the screen drainage.

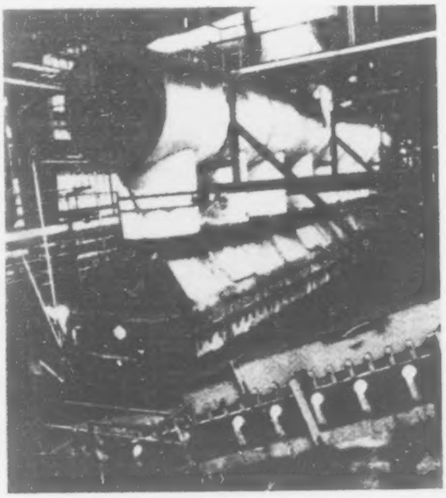


Figure 4. Vibrating Bed Dryer

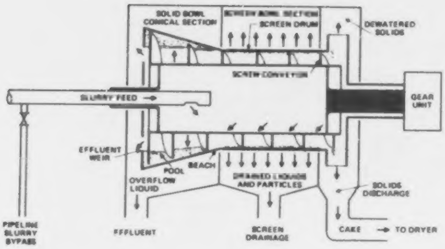

SOLID BOWL CONICAL SECTION
SCREEN BOWL SECTION
SCREEN DRUM
DEWATERED SOLIDS
SCREW CONVEYOR
SLURRY FEED →
GEAR UNIT
EFFLUENT WEIR
POOL
BEACH
OVERFLOW LIQUID
DRAINED LIQUIDS AND PARTICLES
SOLIDS DISCHARGE
PIPELINE SLURRY BYPASS
EFFLUENT
SCREEN DRAINAGE
CAKE → TO DRYER

Figure 5. Screen Bowl Centrifuge

Ideal test conditions for determing the effect of a variable (temperature, feed concentration, etc.) would be to hold all other variables constant. This idealized condition, however, is not practical. The alternative is to make adjustments for variables that should remain constant, or more scientifically, to perform a regression analysis (Figure 7). The following linear relationships were found to provide a reasonable fit to the data.

Higher-order functions did not improve the correlation. The correlations for the nonrecycle flow sheet show that within ranges tested, the independent variables affect cake moisture and centrifuge recovery as follows:

- Higher feed rates reduce cake moisture and improve recovery. Therefore, the centrifuge should be operated at its maximum capacity. Limiting factors are usually motor hp or differential torque.

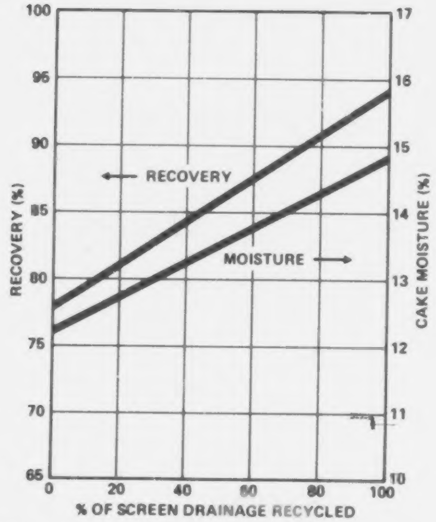
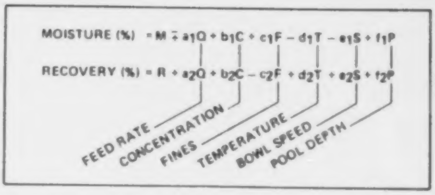


Figure 6. Centrifuge Performance Effect of Screen Drainage Recycle



$$\text{MOISTURE (\%)} = M \mp a_1Q + b_1C + c_1F - d_1T - e_1S + f_1P$$

$$\text{RECOVERY (\%)} = R + a_2Q + b_2C - c_2F + d_2T + e_2S + f_2P$$

FEED RATE
CONCENTRATION
FINES
TEMPERATURE
BOWL SPEED
POOL DEPTH

Figure 7. Centrifuge Performance Regression Analysis

- Higher slurry concentrations improve recovery, but cause a wetter cake. The latter effect is more significant, which would argue for diluting the feed. It is interesting, however, that these effects are reversed when screen drainage is recycled.
- A finer feed, as might be expected, will produce a wetter cake and lower recovery. The fineness, however, is a specification of hydraulic transportation and cannot be adjusted solely for the sake of dewatering.
- Higher temperatures lower viscosity and surface tension of water. These effects improve solids-water separation in the solid bowl and screen sections, respectively. This is clearly reflected in the correlations, which show moisture reduction (Figure 8) and increased recovery with higher temperatures.
- Increased bowl speed creates higher "g" forces, which improves moisture and recovery. In the 44-inch diameter centrifuge, an increase of 100 rpm will decrease cake moisture by approximately half a

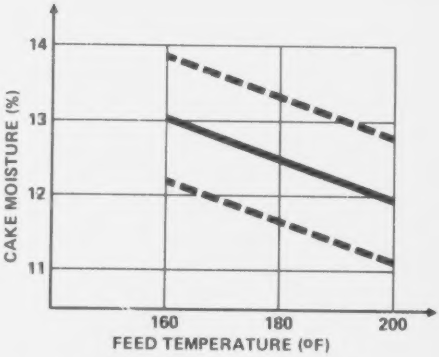


Figure 8. Centrifuge Performance Effect of Feed Temperature

percentage point. The accelerated wear at higher bowl speeds must be offset against improved process results.

- A deeper pool in the solid bowl section improves recovery, but also increases cake moisture. To properly balance this variable requires a knowledge of secondary dewatering characteristics.

BELT FILTER OPERATION

The most successful dewatering of the centrifuge effluent was achieved in the double belt filter (Figure 9). The feed slurry is first mixed with flocculant in a mixing tank. Selection of the flocculant and appropriate mixing with the slurry are critical variables in the optimization of secondary dewatering. These variables greatly influence cake moisture and cost of flocculants, which is a substantial cost in the dewatering process.

The flocculant coagulates the finer particles and yields improved recovery (targeted at 99 plus percent). Flocculants also tend to trap water, which results in higher cake moisture. The better products required less than half a pound of flocculant per ton of coal dewatered.

The slurry/flocculant mixture is evenly distributed over the lower belt gravity zone section, where dewatering starts by gravity filtration. The "sloppy" cake then moves into the wedge zone, where upper and lower belts join to squeeze out more water. The cake is then exposed to higher pressures created by the rollers in the "S" zone of the belt filter.

In addition to the flocculant or its mixing in the slurry, other variables found to affect cake moisture are:

- Feed concentration

  Higher concentrations will yield lower cake moistures.

- Slurry temperatures

  As with centrifuging, higher temperatures enhance dewatering; however, certain flocculants are not as effective at elevated temperatures.

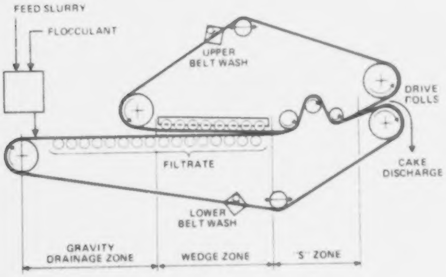


Figure 9. Double Belt Filter

- Fines in feed and size distribution

  Finer feed will result in higher cake moistures, as was the case in the centrifuge. However, more significant in belt filtration is the entire size distribution. A gradation in the feed size reduces void space which normally holds the moisture. The following graph (Figure 10) illustrates the dramatic effect of adding coarse material to the otherwise exclusively fine belt filter feed.

  - Centrifuge centrate only contains 100 percent minus 325 mesh, which produces a belt filter cake of about 55 percent surface moisture. The secondary solid bowl centrifuge provided similar results.
  - The addition of the centrifuge screen drainage to its centrate improves the cake moisture on the belt filter by more than ten percentage points. Of course, one must take into account that this has more than doubled the feed to the belt filter.
  - Bypassing approximately ten percent of the primary feed to the filter further improves the cake moisture. But volume to secondary dewatering is increased.

PROCESS OPTIMIZATION

In the analysis of the centrifuge data, we identified several variables that forced a trade-off between moisture and recovery. As mentioned earlier, it is not possible to select an optimum operating point in isolation from other equipment in the process. Similarly, in the belt

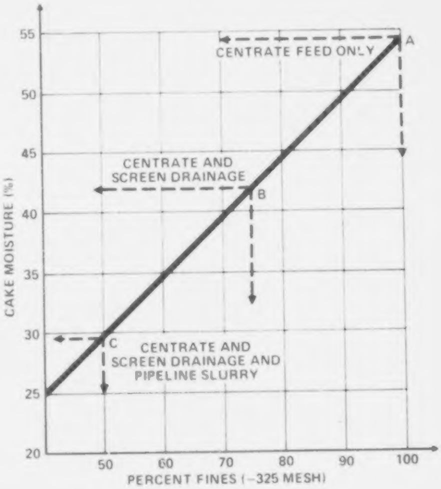


Figure 10. Belt Filter Performance

filter, lower moistures are offset by the larger volumes reporting to the secondary dewatering.

The combined moisture of primary and secondary cakes is the principal determinant in the circuit optimization. Other considerations are flocculant cost, equipment wear, and cake handling characteristics.

As illustrated in the following table, certain conditions favored a centrate-only feed to the belt filter, and other conditions favored the addition of screen drainage and some primary feed to the centrate before belt filtration. A key to this optimization is the degree to which primary cake moisture and secondary cake moisture are improved by not recycling centrifuge screen drainage and bypassing primary feed. This condition was influenced by uncontrollable variables, e.g., feed characteristics and equipment wear conditions. Furthermore, measurement accuracy of the dependent variables could also affect the project optimization.

What can be concluded from this test data is that circuit optimization can improve the combined moisture by 1 to 1.5 percentage points, which is significant in terms of Btu's required for drying of the cake. Also significant for design purposes is that circuit optimization may change with time. Therefore, commercial design of the dewatering circuit should provide flexibility to allow operators to make process adjustments.

DRYING AND DUST COLLECTION

The vibrating bed dryer has been an effective device in drying dewatered pipeline coal. It can produce a consistent and uniformly dried product.

The operation of a vibrating bed dryer (Figure 11) is simple. The moist warm cake moves by saltation on a long screen through which heated air is blown. The air velocity, created by the screen slots, suspends the particles so that the material is fluidized. This offers maximum contact area between moist particles and air for rapid evaporation of the water. Sensible heat in the feed cake and air heat provide the necessary energy for evaporation. Adiabatic flashing cools the cake to approximately 105°F.

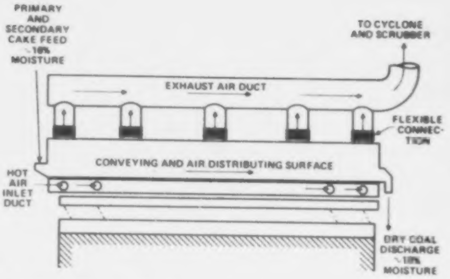

PRIMARY AND SECONDARY CAKE FEED ~16% MOISTURE
TO CYCLONE AND SCRUBBER
EXHAUST AIR DUCT
FLEXIBLE CONNECTION
CONVEYING AND AIR DISTRIBUTING SURFACE
HOT AIR INLET DUCT
DRY COAL DISCHARGE ~10% MOISTURE

Figure 11. Vibrating Bed Dryer

Although some predictions of 16 percent and higher solids carry-over in the dryer were made, actual measurements indicate carry-over of not more than 2.0 percent of the feed. This can be explained by the fact that pipeline coal is not dusty above seven percent surface moisture, and that fines agglomerate and do not behave as discrete particles. The ASTM dustiness index (Figure 12) illustrates this point. It shows that within the oper-

TABLE 1

DEWATERING PROCESS OPTIMIZATION

FEED TO BELT FILTER	PRIMARY CAKE % OF TOTAL	PRIMARY CAKE % MOISTURE	SECONDARY CAKE % OF TOTAL	SECONDARY CAKE % MOISTURE	COMBINED % MOISTURE
CENTRATE	94	13/14	6	54	15.5/16.4
CENTRATE AND SCREEN DRAINAGE	86	12/11	14	42	16.2/15.3
CENTRATE AND SCREEN DRAINAGE AND PIPELINE SLURRY	77	12/11	23	29	15.9/15.1

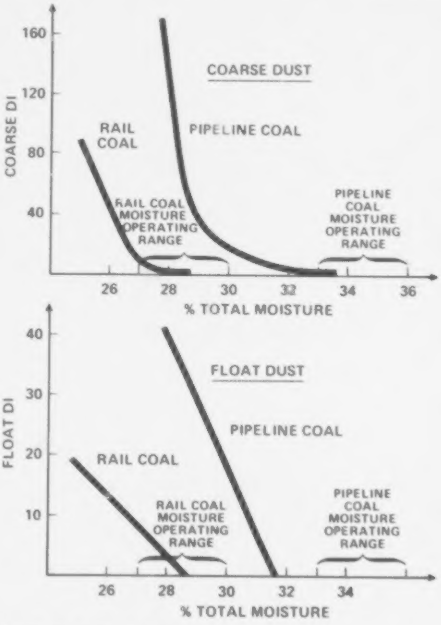


Figure 12. Dustiness Indices

ating range (8–12 percent surface moisture) the pipeline coal cake is not dusty. The experience in the dryer confirms that this material is uniformly dried.

This phenomenon also explains the excellent efficiencies in the cyclone (95 percent plus) and wet scrubber (99.6 percent plus).

CONCLUSION

The experience at the CEP confirms that equipment selected for the ETSI process through studies and pilot plant tests is well matched for this application.

The data further demonstrate that each piece of equipment cannot be optimized without taking into account its effect on the performance of other equipment in the circuit.

The data has provided a solid basis for our ETSI design and has identified the need for flexibility in the dewatering circuit so that operating optimizations can be accomplished under the varying conditions we may encounter during commercial operation.

The CEP was mothballed in May 1982. A decision about its disposition has not yet been made. It is possible that the CEP could be reactivated during the detailed engineering phase to provide further optimization information and to conduct tests on improved wear parts.

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THE STORAGE AND HANDLING OF DEWATERED PIPELINE COAL

Peter F. McEwan and Walter P. Corneto

ETSI Pipeline Project

U.S.A.

INTRODUCTION

The ETSI Pipeline Project intends to transport coal in slurry form from the Powder River Basin in Wyoming to power plants in Oklahoma, Arkansas and probably Texas. The slurry will be a mixture of coal and water in approximately equal proportions. Before being discharged at the point of delivery, the coal will be dewatered to produce a fairly dry, consistent, finely ground product which can be handled, stored and fed to the power plant boilers in a similar manner to coal delivered by railroad or other means of transport.

The methods and techniques of preparing the slurry, pumping it through the pipeline and then dewatering it are discussed elsewhere. This paper is concerned with handling of the coal once it has left the dewatering plant, storing the coal and then preparing it as fuel for the boilers of a large, modern power plant.

The ETSI Pipeline Project, which is a joint-venture among Texas Eastern Corp., InterNorth, Bechtel, and Kansas-Nebraska Natural Gas Company, established a Coal Evaluation Plant (CEP) on the site of the White Bluff Power Plant in Arkansas during 1981. The purpose of the program was to evaluate the behavior of various coals in the ETSI preparation and dewatering processes. Arkansas Power & Light, which operates the White Bluff Plant, participated in the test program. Some 55,000 tons of coal—mainly from the Jacobs Ranch Mine—were diverted from the normal plant feed system, made into slurry, dewatered, and then either stockpiled or burned in a series of full scale tests in the No. 2 unit of the power plant. The CEP test program started in October, 1981 and ended in April, 1982. However, a 30,000 ton stockpile has been kept for evaluation and for a full load, 48 hour test burn that will take place in the power plant this coming April.

The information presented here was obtained from observations made at the CEP during normal operations, as well as from an on-site materials testing program. A series of sequential component tests were conducted by AP&L in the power plant. Also, a test shipment by barge of 1500 tons of coal was made from Pine Bluff to the New Orleans area. As a result of all this work, ETSI and AP&L have gained real, hands-on experience with a full-scale operation using dewatered pipeline coal. We have been pleased to find that, in general, the material is not difficult to handle; it does not introduce new environmental problems and is a consistent, easy to use fuel for power plant boilers (Figure 1).

GENERAL COAL CHARACTERISTICS

The coal tested at the CEP originated from the Jacobs Ranch Mine near Gillette, Wyoming, and is considered to be typical of Powder River Basin coal. From a materials handling point of view, it is typical of any subbituminous coal that has been transported as a slurry with the same size consist and dewatered to the same moisture level. Some coal from other mines was processed at the CEP but no variations were noted which might have an influence on handling or stockpiling. The basic characteristics of the coal are summarized in Figure 2.

When this coal is made into slurry and then dewatered, its characteristics at the dewatering plant point of delivery would be as shown in Figure 3.

The size consist is determined by the requirements of the pipeline and is controlled within very narrow limits. Although it is fairly fine, it is not yet fine enough for combustion in most power plant boilers and, therefore, the pulverizers are still needed both to dry the coal and to reduce its size to the proper level.

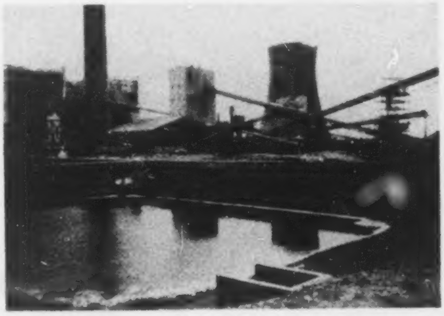

Figure 1. ETSI's Coal Evaluation Plant at White Bluff

	RANGE
% MOISTURE	24.5 – 32.0
% ASH	4.4 – 9.4
% VOLATILES	26.4 – 37.1
CALORIFIC VALUE (BTU/LB)	7830 – 8900
% SULFUR	0.33 – 0.59

Figure 2. ETSI Pipeline Project, Basic Characteristics of Jacobs Ranch Coal

- SIZE CONSIST
  - 100% PASSING 14 MESH
  - 55% PASSING 100 MESH
  - 23% PASSING 325 MESH
- MOISTURE – 9-10% SURFACE MOISTURE
- BULK DENSITY – 35-45 LBS/CU-FT
- ANGLE OF REPOSE – 37 DEGREES
- DUSTINESS INDEX
  - 6.0 AT 6.0% MOISTURE
  - 1.1 AT 7.5% MOISTURE
  - 0.2 AT 9.0% MOISTURE

Figure 3. ETSI Pipeline Project, Basic Characteristics of Dewatered Pipeline Coal

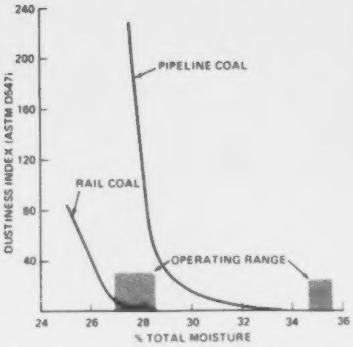

Figure 4. ETSI Pipeline Project, Dustiness Index for Coarse Dust (ASTM D547)

The moisture of the coal delivered from the dewatering plant can be controlled and is a matter of balancing economics with the practical necessity of having to handle the coal and to avoid excessive dust while doing so. ETSI has specified 10% surface moisture for its dewatered product. This level is dry enough for materials handling systems to operate without difficulty, but still provides sufficient operating flexibility for occasional over-drying to occur without producing an excessively dusty product.

The creation of fugitive airborne dust is a major concern when operating any coal handling system. Since Jacobs Ranch coal is not unique in this respect, and since dewatered pipeline coal has a finer distribution than the same coal delivered by rail, considerable attention has been paid to this issue. A test program was conducted at the CEP to determine the degree of dustiness likely to be encountered when handling pipeline coal. ASTM standard No. D547 outlines the equipment and procedures to determine a standardized "Dustiness Index". The results shown in Figure 4 compare the dustiness of pipeline coal with the same coal delivered by rail.

It is to be expected that because of the finer particle size the dewatered pipeline coal will have a higher dustiness index at the same moisture level than rail delivered coal. However, if one looks at the moisture levels at which the two coals are normally handled, it is immediately apparent that pipeline coal is less likely to cause dusting than the coarser, drier coal usually delivered by rail. Throughout the CEP test program, the general freedom from dust was very much apparent, and the only incidents which caused difficulty occurred under unusual circumstances when a stockpile which had dried out completely was being moved from one place to another during a period of high wind.

Spontaneous combustion is another concern when handling and storing any coal. The fineness of pipeline coal and the cohesiveness which is derived from the surface moisture present limits the movement of gases through the body of a pile of the coal. As a result, there is a very low likelihood of spontaneous combustion. We do not have the data which enables us to rate pipeline coal on a scale of measurement relative to other coals, but our experience at the CEP showed that uncompacted coal can be stored in open piles for periods of a week to ten days or even longer without danger. If the stockpiles are compacted (to about 60 lbs/ft^3) then the tendency towards spontaneous combustion is entirely absent.

During the entire CEP program only one significant "hot-spot" was observed. One end of an open, uncompacted stockpile showed a temperature of 120°F after 10 days of undisturbed storage. This was easily dealt with by spreading and compacting the coal (Figure 5).

On other occasions, local increases in temperature were observed (not above 100°F) but these disappeared on their own after a few days. It is strongly believed that stockpiles which need to be kept longer than a few days should be compacted. This is sufficient to virtually eliminate concern about spontaneous combustion. Thorough compaction should be an intrinsic part of any effective fine coal stockpile management program.

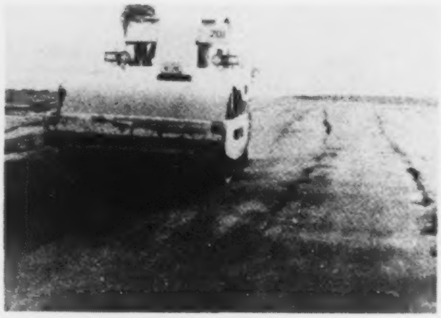

Figure 5. Compacting of Coal Stockpile

LABORATORY TESTWORK

Any fine granular material containing a significant quantity of moisture is likely to have sufficient cohesive strength and resistance to flow to cause difficulties when discharging from a bin or silo if the bin or silo is not properly designed. In order to determine the parameters governing the discharge of pipeline coal from silos and bins, an on-site laboratory was set up by Jenike & Johanson, Inc., bulk handling consultants, and a comprehensive test program was carried out by Ms. M. Jean Casey, Field Engineer, Bechtel Group.

Jenike & Johanson's well-established flow function measurements provide two silo design factors: the hopper opening size and the slope of the hopper sides for mass flow to take place.

The surface moisture content is by far the most significant factor governing opening size. As the moisture increases, so does the cohesive strength of the coal and it is more likely to form a stable arch over an opening. The cohesive strength also increases somewhat with time and it is sometimes necessary to use a well placed vibrator or "thumper" to initiate flow after a period of rest. Of course, once an arch is broken and the mass of coal is moving, the arch will not re-form as long as the opening is larger than the minimum size needed for instantaneous flow. The limiting values for a circular hopper opening can be seen in Figure 6.

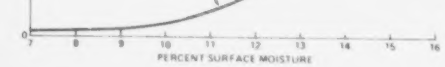

Figure 6. ETSI Pipeline Project, The Effect of Surface Moisture on Hopper Opening Size

The necessary slope of the side of a hopper to achieve a mass flow pattern was found to depend mainly on the surface moisture of the coal and the material from which the wall is made. The average hopper angle for the 8–12% moisture range with various wall materials and surface finish is shown in Figure 7.

True mass flow is difficult to achieve unless large openings and very steep slope angles are used. However, as long as stable ratholes do not develop, satisfactory plug flow from self cleaning hoppers with reasonable dimensions is possible. The pulverizer feed hoppers at White Bluff have 78° sides and are made of No. 304 stainless steel which has become highly polished in use. Fitted with 3 foot diameter openings, these hoppers provide satisfactory flow to the pulverizers. The flow pattern is usually plug flow, however, the hoppers empty out completely without leaving any dead material on the sides. Low frequency thumpers are fitted to the lower portion of the conical bottom to break any arch which may form. These are more of a precaution than a necessity and are seldom used.

Some interesting lab work was also done to determine the effectiveness of additives used to enhance the flow characteristics of the coal under conditions of high moisture content. The lab work determined that both water absorbent polymers (which reduce the apparent surface moisture of the coal) and surfactants (which reduce the cohesive strength of the water film which binds the particles) can be used effectively to improve the flow of coal from hoppers. However, these additives are expensive and their use does not appear to be warranted for dewatered pipeline coal under any circumstances we expect to encounter.

HOPPER WALL MATERIAL	MINIMUM HOPPER ANGLE FROM HORIZONTAL FOR MASS FLOW* OPENING DIAMETER		
	2 FT	4 FT	6 8 FT
• STAINLESS STEEL 304 1	82°	81°	81°
• STAINLESS STEEL 304 1 COAL POLISHED	82°	76°	70°
• ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE (UHMWPE)	66°	64°	62°

*4 DEGREE SAFETY FACTOR INCLUDED. CONICAL HOPPER

Figure 7. ETSI Pipeline Project, Hopper Angle Requirements 8-12% Surface Moisture

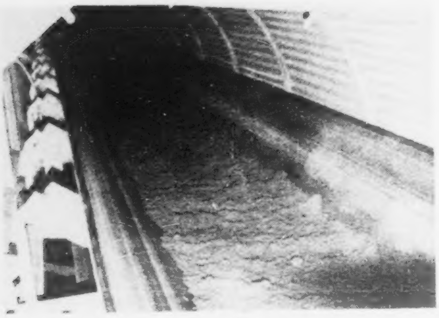

Figure 8. Pipeline Coal on Conveyor Belt

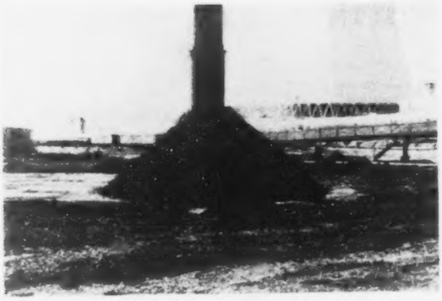

Figure 10. Stacking Out Pipeline Coal

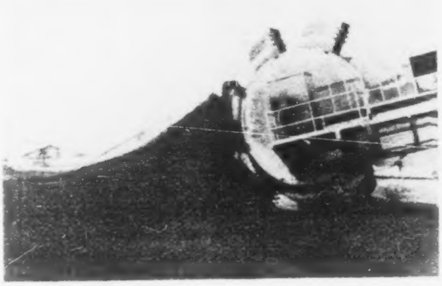

Figure 11. Reclaiming Pipeline Coal

COMPONENT TESTING

The main focus of the CEP test program was on the preparation and dewatering of slurry. However, AP&L made sure dewatered pipeline coal was fed through each portion of the power plant's coal handling system in a carefully planned sequence. This was done while the power plant was on line. Care was taken to make sure that each section was clear before the next was exposed to pipeline coal. This was done in order to minimize the danger of a blockage in a surge bin or transfer point that would prevent rail coal from being delivered to the boilers when required.

It is not necessary to limit the speed or angle of inclination of conveyor belts for pipeline coal compared to other coal. The coal loads well: it does not tend to spill or run back; and as a result of the controlled moisture content, it does not become airborne or form dust even at fairly high conveyor speeds (Figure 8).

The results of the component test program are summarized in Figure 9.

The coal can be stacked out by normal means although, as with any coal, the freefall distance should be kept to a minimum, particularly in strong winds. There is little tendency for fine dust to blow away, and airborne particles settle quickly. This is a result of the cohesive effect of the surface moisture and the very consistent nature of the coal (Figure 10).

The bucket wheel reclaimer at White Bluff had no difficulty with dewatered pipeline coal. Bulldozers were generally used to push coal up to the reclaimer. When the reclaimer dug into the compacted stockpile, it showed no tendency to chatter or vibrate, and the capacity of the machine was not impaired (Figures 11 and 12).

While all of the mechanical handling equipment at White Bluff performed satisfactorily on pipeline coal, the

- GENERAL BEHAVIOR – EXCELLENT
- MAXIMUM ANGLE · 21° AT 100 FPM
- MAXIMUM SPEED
  - 600 FPM CEP
  - 685 FPM AP&L
  - 1100 FPM BARGE UNLOADING
- DUSTINESS – NEGLIGIBLE
- CLEANLINESS – EXCELLENT

Figure 9. ETSI Pipeline Project, CEP Experience–Conveying Dewatered Pipeline Coal

- SLEWING AND LUFFING BOOM WITH BUCKET WHEEL RECLAIM
- CAPACITY
  - 2100 TPH STACKING
  - 1600 TPH RECLAIMING
- MCNALLY TYPE UNIT ALL HYDRAULICALLY OPERATED

Figure 12. ETSI Pipeline Project, AP&L Stacker Reclaimer

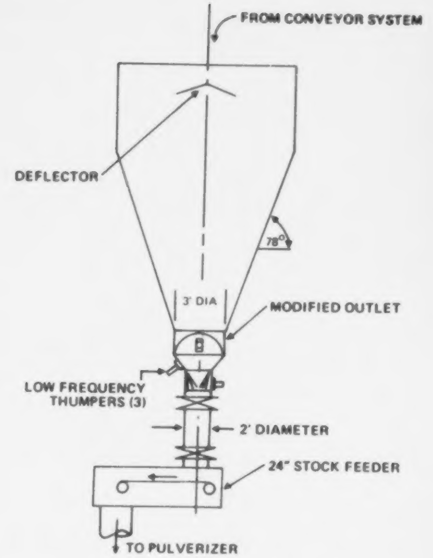

Figure 13. ETSI Pipeline Project, Modifications to Silos at White Bluff

hoppers feeding the pulverizers required some modification. Earlier laboratory testing and work on a similarly shaped test bin had led to the expectation that the 2 foot diameter outlets would not clog up. However, in practice, this was not to be. The silos at White Bluff are some 70 feet high with conical sides sloped at 78° to the horizontal (Figure 13).

The feed to these silos is in their center, and the long drop causes an overpressure effect which can result in the formation of a very stable arch. In order to avoid this, a deflector was installed at the top. At the same time, a modification was made to the bottom of the cone to permit a 3 foot diameter outlet with an adaptor to match the existing 24-inch Stock gravimetric feeder. As a precaution, low frequency, high amplitude "thumpers" were fitted to the bottom of the hopper but, in operation, these were very seldom used (Figure 14).

The Stock feeders performed satisfactorily although there was some loss in capacity because of the lower bulk density of the pipeline coal. It was also found that certain types of sonic flow detectors functioned poorly with pipeline coal. Relatively minor modifications to the feeders will be performed in preparation for a full-scale, 48-hour burn test expected to take place this April. Hopefully, full details will be presented in a later paper.

Figure 14. Mill Feed Silos at White Bluff

Figure 15. Stockpile Surface After 8 Months

STOCKPILING

As described earlier, live stockpiles of uncompacted pipeline coal can be operated and managed quite easily with a minimum of dust and little danger of spontaneous combustion. In practice, however, live stockpiles are kept to a minimum and should not be kept on the ground for longer than a week to ten days. After this time, the coal must be either used or transported to a "dead" stockpile where it must be spread and compacted. Depending on the circumstances, it may also be advisable to spray the surface with a binding agent to prevent dusting and to permit water run-off with a minimum of erosion.

At White Bluff, a 40,000 ton stockpile was established for component testing and long term evaluation and to provide feed for the 48-hour burn test scheduled for April. The methods of constructing the stockpile described here were developed after some experimentation. There are obviously many ways of working a stockpile, but our methods gave satisfactory results. After eight months on the ground in quite severe weather, the pile is still in very good condition and has suffered only minor erosion and minimum dust (Figure 15).

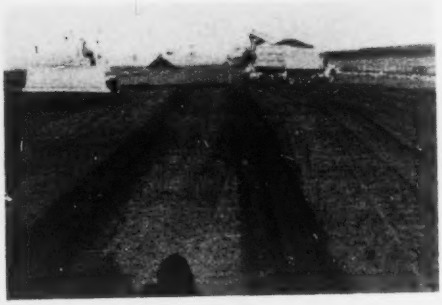

Figure 16. Stockpile Being Made

Figure 17. Stockpile Coating Application

The stockpile was made by spreading the coal in layers 8" to 18" thick and then compacting it with the tires of the earthmoving equipment or with vibrating rollers to 60–70 lbs/ft^3 (Figure 16). During times when high winds were being experienced or very dry coal was being handled, a water truck was used to control dust.

Once the stockpile has been built to the required height, it should be shaped with a bulldozer or grader so that it has a fairly smooth surface with a slight crown. Side slopes can be made as steep as safe operation will allow. At White Bluff, side slopes of 1 in 5 were found to be quite satisfactory. Once the pile is shaped, the whole surface should be smoothed with a vibrating roller to provide a fairly hard, smooth surface. This surface is then sprayed with a binding agent to form a hard crust which is resistant to dust being picked up by the wind and permits rain to run off with a minimum of erosion. At White Bluff, the pile has been re-surfaced and sprayed about every three months.

Various chemical products have been used to treat the surface of the pile with mixed results. At present, a 15% solution of Nalco 7990 applied at the rate of 2000 gal/acre is providing a good, firm crust and is preferred by the operators because it is easy to mix and apply (Figure 17).

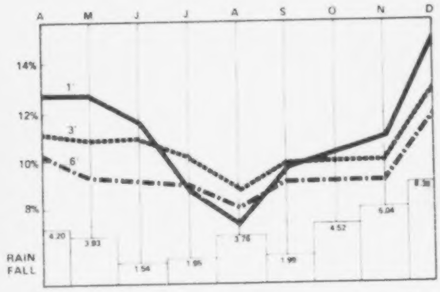

Figure 18. ETSI Pipeline Project. Surface Moisture Variations in Stockpile

It should be mentioned that once the pile has been treated and a good surface treatment is in place, it is absolutely essential that vehicles must not drive over it unless they are engaged in repairing or reclaiming the pile. The protective crust is not able to withstand heavy traffic and rapidly becomes useless if regularly driven over.

The moisture level in the stockpile tends to reflect the weather. The White Bluff pile was built with an average surface moisture of 10.8% and its behavior over the last ten months can be seen in Figure 18.

The average moisture level fell during the hot summer and increased following heavy rains during December and January, but the total variation is no more than ±2 around the average.

In general, this stockpile has been very stable, it has been free of environmental problems and has shown no tendency towards spontaneous combustion. Due largely to the binding effect of the surface coating and the smooth surface product by rolling, the stockpile has been able to withstand severe rain erosion.

It was easy to build and reclaim and has required very little maintenance. It has survived very severe weather, and we are confident that the operation and maintenance of stockpiles in commercial operation will not be any more difficult than with rail delivered coal. Because of the very consistent nature of the coal and its freedom from dust when it is at the correct moisture level, stockpile operations should be very efficient and trouble free.

CONCLUSION

Dewatered pipeline coal, which is finer and has a higher moisture level than rail delivered coal, is relatively free from dust and is easily handled on conventional conveyor belts. Special considerations are required in the design of bins and hoppers to avoid the possibility of plugging. In addition, steeply sloped hopper sides are necessary for mass flow.

Bulldozers and other mobile equipment usually operating on coal piles are suitable for use with pipeline coal, and satisfactory stockpiles can be made by spreading and compaction. Surface treatment is desirable if the piles are to be left for long periods, and there is very little tendency towards spontaneous combustion.

STA Slurry Technology Association

1800 Connecticut Avenue, N.W. • Washington, D.C. 20009 • (202) 332-5751

September 24, 1987

The Honorable J. Bennett Johnston
United States Senate
136 Hart Office Building
Washington, DC 20510

Dear Senator Johnston:

Enclosed please find a copy of a letter which I am sending to Senator Conrad to further address a number of questions which he raised at the hearings of September 10, 1987. I would appreciate your making my letter to Senator Conrad a part of the hearing record for the September 10th hearing on S. 801 the "Coal Distribution and Utilization Act of 1987".

Sincerely,

SLURRY TECHNOLOGY ASSOCIATION

I. Leibson

I. Leibson
Chairman

IL/ds

Slurry Technology Association

1800 Connecticut Avenue N.W. • Washington, D.C. 20009 • (202) 332-5751

September 24, 1987

The Honorable Kent Conrad
U.S. Senate
825-A Senate Hart Office Building
Washington, DC 20510

Dear Senator Conrad:

I appreciated the opportunity to testify before you and the Committee on Energy and Natural Resources on Thursday, September 10, 1987. You asked me a number of questions to which I would like to respond more completely for the hearing record.

Question 1: How many acre feet of water would be required to transport 50-60 million tons of coal through a coal slurry pipeline.

Answer: The amount of water to transport 50-60 million tons of coal per year would be 40,000-48,000 acre feet per year. This is based on actual water use requirements of the Black Mesa pipeline which has been in operation since 1970.

Farmers are appropriately concerned about any industrial use of water which might jeopardize water availability for agriculture. However, neither coal slurry pipelines nor legislation considered constitutes any threat to agriculture.

First, **the volume of water used by coal slurry pipelines is in comparison to other industrial uses not large.** By way of comparison, a coal slurry pipeline uses only 1/5 to 1/7 the amount of water required for a mine mouth electric facility and approximately 40% the amount of water required for a coal gasification plant. To further illustrate this point, consider the water needs of the proposed ETSI project. ETSI intended to transport approximately 25 million tons of coal annually from Wyoming to Arkansas. To move this volume of coal, ETSI required 20 thousand acre feet of water per year. When this amount of water is put into proper perspective it is clear that it represents no threat to any state's water resources. Sepcifically, consider the following:

- **The average annual flow of the Missouri River at Sioux City, Iowa, is one thousand seventy (1,070) times as much as the ETSI pipeline would have used. (Missouri River flow -- 21,400,000 acre feet v. ETSI -- 20,000 acre feet).**

Dedicated to the advancement of pipeline delivery of solids and direct firing of coal-liquid mixtures

- The six huge Missouri River mainstem reservoirs can store three thousand seven hundred twenty (3,720) times as much water as ETSI would have used. (Storage capacity -- 74,400,000 acre feet v. ETSI -- 20,000 acre feet).

- The annual evaporation of Lake Oahe in South Dakota where ESTI proposed to purchase water is ten (10) times as great as ETSI's water requirements. (Evaporation -- 200,000 acre feet v. ETSI -- 20,000 acre feet).

- Annual evaporation on all six mainstem reservoirs of the Missouri River is seventy-five to one hundred (75-100) times as much as ETSI would have used. (Evaporation -- 1,500,000-2,000,000 acre feet v. ETSI -- 20,000 acre feet).

- ETSI's use of 20,000 acre feet would be annually 1/60th of the identified as surplus to foreseeable needs under the Pick-Sloan Missouri Basin Program and is currently available for energy usage. ("Water for Energy," U. S. Bureau of Reclamation, 1977).

- 671 ETSI pipeline projects would be required to equal annual usage of Missouri Basin water by Nebraska.

The above facts clearly show that the water needs of those pipelines likely to be built in the forseeable future hardly constitute a threat to any state's water resources.

Second, coal slurry pipelines do not need potable water which is otherwise needed for human consumption or agricultural irrigation. Slurry pipelines can use brackish or even secondarily-treated wastewater. As such, coal slurry pipelines represent a new opportunity to resolve a community's environmental problems associated with disposal of brackish or secondarily-treated water.

Third, Section 205 of H.R. 1531 and Section 5 of S. 801 (which are substantially the same) specifically mandate that state substantive and procedural water law, including existing and future interstate compacts, shall govern all related issues. Under the proposed legislation, a state can even deny water to a coal slurry project regardless of the adverse impact of such a decision on interstate commerce. Drafted by western Representatives, Senators and water law experts, the water provisions expressly delegate to the states all of Congress' power under the Commerce Clause to regulate interstate commerce as it pertains to the acquisition and use of water by coal slurry projects. Section 205 of H.R. 1531 and Section 5 of S. 801 are precisely the type of explicit delegation of Congressional constitutional authority which the Supreme Court in **Sporhase v. Nebraska** found necessary to protect the states' control over their interstate water resources. It is also important to emphasize that pursuant to Section 203 (a) of H.R. 1531 and Section 4 of S. 801, a coal slurry pipeline water permit must be obtained before it can even apply for federal eminent domain certification.

As a result of these carefuly crafted provisions, the states stand to have more control over their water resources with the adoption of this legislation than the states possess today. These enhanced state protections clearly will inure to the benefit of farmers and make water more secure for irrigation and other agricultural uses. The point is that neither the volume of water needed by slurry pipelines nor the provisions of H.R. 1531 and S. 801 create a legitimate threat to agricultural interests.

Question 2: Won't the loss of coal traffic by the railroads due to coal pipeline competition force railroads to raise their rates for hauling grain?

Answer: The railroads have held America's farmers hostage for years with exorbitant rail rates. In fact, the farmers' need to fight these rates led to the creation of the National Grange and other farm groups. The railroads are now terrorizing the agricultural community with the threat of huge rate increases for grain if coal slurry pipelines are built. Analysis of a few facts will demonstrate that coal slurry pipelines will not cause increases in grain transporation rates.

First, the problems of prohibitively high railroad coal rates and the quality of rail service faced by agriculture and industry today exist independently of the coal slurry issue. Clearly, the chorus of resounding complaints from all segments of American shippers decrying monopoly rates, deteriorating service, and abandonment of essential rail lines is irrefutable evidence that the problem of railroad rates and practices exists today in the absence of competition by coal pipelines. Consequently, the notion that construction of coal pipelines would create some new and previously unknown impetus for railroads to charge agricultural or any other type of shipper the highest possible rates, or would cause deterioration of currently benign treatment of shippers by the railroads is without merit. It is simply unfair for the railroads to hold a more efficient transportation technology like coal pipelines hostage to a problem it neither created nor will exacerbate.

Second, contrary to their claim, the railroads will not lose existing coal tonnage as a result of slurry pipelines. There is unanimous agreement among government analysts that coal production in the U. S. will significantly increase over the next ten years, as will the need to transport this increased production to market. The Department of Energy (**Annual Energy Outlook, 1986**) expects coal production to reach over 1.1 billion tons of coal by 1995, or 230 million tons more than in 1984.

Coal pipelines will carry only a portion of the projected increase in coal production. In a 1985 report by the Energy Information Administration (**Coal Slurry Pipelines: Impact on Coal Markets**), the agency (EIA) selected for study four likely pipelines to be built in the U. S. by 1995. If these four pipelines had been built, the agency concluded that only 47 million tons of coal would shift from rail to pipe. These pipelines would have moved only 20 percent of the increase in domestic coal production by 1995, which would represent only 4.3 percent of total U. S. coal production in 1995. Moreover, because no pipelines could be engineered, permitted and constructed in less than five years, railroads would not lose any volume of coal traffic to pipelines during this period.

Because railroads would continue to haul the bulk of coal, EIA found that had the four pipelines been built and operated at the agency's projected rates, railroad revenues would not be adversely affected and coal users would benefit:

> ". . . Railroad revenues from coal carriage would still be almost 60 percent higher and railroad ton-miles nearly 30 percent higher in 1995 than in 1984..." and "Coal users could realize savings of between $200 million and $1 billion in 1995. . .".

Given the invalidity of the railroads' claim that their coal traffic volume will decline, the "threat" that agricultural shippers will be exposed to higher rail tariffs to make up revenues lost because of coal slurry pipelines is baseless.

Lastly, it should be noted that regardless of the volume of coal they haul, the railroads cannot unilaterally raise grain haulage rates. At hearings before the House Public Works Subcommittee on Surface Transportation (December 8 and 9, 1981), Association of American Railroads President William Dempsey testified that **85% of the non-coal rail traffic is competitively priced.** This means, said Dempsey, that if the railroads were to raise their rates on these commodities, they would simply lose the business to competing modes of transportation. The Federal Railroad Administration (FRA) has specifically addressed this issue with respect to grain. On August 7, 1984, in response to questions posed by members of Maryland's Joint Committee on Coal Pipeline Resources, Thomas A. Till, Deputy Administrator of the FRA, said rail grain traffic is competitive with barge and truck grain traffic. Grain traffic, he stressed, is not related to the transportation of coal, but to the competition of grain itself. Moreover, it is important to recognize that the Staggers Rail Act, which freed the railroads from most regulatory structures, prohibits the cross-subsidization of one commodity for those of another commodity.

I hope these responses fully address your concerns raised at the hearings. I would be happy to provide any futher information you may need or answer any additional questions you may have.

Sincerely,

SLURRY TECHNOLOGY ASSOCIATION

I. Leibson

I. Leibson
Chairman

IL/ds

The CHAIRMAN. Thank you very much, gentlemen. I really wanted to follow up on this water cleanup, but I don't think we have time. We might do that in writing. Thank you.

The next panel will be William H. Dempsey, president and chief executive officer of the Association of American Railroads; Richard I. Kilroy, chairman of the Railway Labor Executives Association; Arthur E. Lundvall, Jr., vice president for fossil energy at Baltimore Gas & Electric representing EEI; and Joseph E. Lema, vice president for transportation of the National Coal Association.

Gentlemen, welcome to the committee. I am sorry we have gotten so far behind. Bill Dempsey, since we had so much to say about you, we are not going to restrict your time, but everyone else will have to quickly summarize because we have a vote at 11. Then we have another panel, and we have to conclude this by 12 because we have a markup this afternoon. So, gentlemen, please proceed. Bill Dempsey first.

STATEMENT OF WILLIAM H. DEMPSEY, PRESIDENT, ASSOCIATION OF AMERICAN RAILROADS

Mr. DEMPSEY. Thank you, Mr. Chairman. I will be brief, but I am glad to be here because I appreciate you have an open mind on the subject, and so I would like to make our points. But I will make them swiftly.

You know what the position, of course, of the industry has been ever since this issue first came to the Congress in 1972. It has not changed.

And we talk about States' rights, and I don't mean to overexaggerate that argument. But you know, I am from a small farming town in Minnesota, and eminent domain is a matter that arouses great emotions in a farming community. They don't like to have the south 40 cut off by whatever kind of line is coming through there at harvest time or plowing time or seeding time, whatever.

So, what we really are dealing here is a situation in which the advocates of eminent domain have not been able to persuade the States, and I take it, for reasons like that. And Senator Ford referred to the same kind of thing in his State. And so, they are asking the Congress to intervene and to override the judgment of the States.

Now, that is fine. That is why we have a Congress, to override parochial interests. But at least there ought to be a compelling case made, and I am sure that the chairman would agree with me on that principle.

What is the case? It used to be in the old days that the railroads couldn't transport the amount of coal that was anticipated. Well, that argument is not being advanced anymore. And of course, our problem in the industry is overcapacity rather than undercapacity. So, I can put that one aside.

The Chairman referred to coal rates. And we have gone into that in my statement, and I would be glad to engage in whatever extensive debate may be useful on the point. The fact is, though, that for example since 1980, it was projected by some that coal rates would explode because of deregulation. Well, in fact, they have gone down 4 percent—BLS figures in real dollars. That is about the same as all rail rates. They have gone down about 5 percent on average. And all of these figures have been gone into in great detail in connection with the CURE bill, and I just think that the case cannot be made that rail rates are exorbitant in this country. Only 20 percent, indeed, are above the jurisdictional threshold for regulation by the Interstate Commerce Commission.

But put that aside because there is a wholly new development here that I trust the committee will consider, and that is this. Under the new maximum coal rate guidelines established by the Commission, if shippers of coal can demonstrate that a coal slurry pipeline would transport that coal more cheaply than the railroad rates, then the railroad rates must be reduced to that coal slurry pipeline rate level so that without any need for having redundant investment in coal transportation facilities, the consumers of coal and electricity get the benefit under current regulatory guidelines of coal slurry pipelines.

The CHAIRMAN. Even though it might not be able to be built because it does not have eminent domain or——

Mr. DEMPSEY. Yes, yes.

The CHAIRMAN [continuing]. For whatever reason?

Mr. DEMPSEY. Yes, that's correct.

The CHAIRMAN. I have not heard of that rule, and I am interested to get the answer to that. This ICC, which has been a cloak of protection for the railroads under the guise of—I don't know under what guise, but I mean, that ICC to me is a joke—cannot have come up with such a rule. And I understand Mr. Lema can answer that. But please proceed.

Mr. DEMPSEY. This Interstate Commerce Commission has just in its two decisions under the constrained market price and guidelines assessed the railroads with something in the range of $45 million in reparations to shippers. So, it is not a Commission that I am particularly enthusiastic about at the moment either. And if anyone in the Congress has a mind to abolish the Commission, we would be glad to lend our hand.

The CHAIRMAN. The ICC?

Mr. DEMPSEY. The ICC, yes.

The CHAIRMAN. Well, I would be glad to cooperate in that. As the diplomats say, I have minimal high regard for the ICC and the protection that they give to American consumers.

Mr. DEMPSEY. Well, I think we are making some progress this morning, Mr. Chairman.

But that is the rule, anyway. Now, whether one agrees with it or not, the fact is that that is the rule. And if a consumer or a shipper can prove that another railroad coming in could do it more cheaply, a barge line could do it more cheaply, a coal slurry pipeline could do it more cheaply, that is the maximum level of the rate.

That is the rate question. And indeed, I may say that talking about mine mouth prices of coal and rail rates, that rail rates have gone up since 1972 less than mine mouth prices.

What are the disadvantages? I will leave to Mr. Kilroy the question of labor, employment, and note only that the result must be obvious. OTA concluded that for one construction job, six rail jobs, permanent jobs, would be lost in the construction of coal slurry pipelines. So, whether the figure is 17,000 or 25,000 or 30,000, whatever it is, the net loss in employment is clear. And as Senator Ford pointed out, these are jobs that will be lost to employees who now hold them.

And let me say that we are in a difficult position. We have cut the employment in the railroad industry since 1980 by 41 percent. We have——

The **CHAIRMAN**. Let me see if I can get this straight. You say there will be a loss of jobs by building coal slurry pipelines.

Mr. **DEMPSEY**. Net loss.

The **CHAIRMAN**. Net loss. And yet, the rail rates would be—you are entitled to cut rail rates to what the coal slurry pipeline would give. You are entitled to that as a right. So, if rates are down where a coal slurry pipeline would be, how do you lose jobs from a railroad to a coal slurry pipeline if there is no rate advantage for the coal slurry pipeline?

Mr. **DEMPSEY**. Well, it is not a question of the rates. It is a question of who is moving the traffic. I mean, if the coal slurry pipelines are moving the traffic, then the railroads are not. And obviously then we lose jobs.

The **CHAIRMAN**. Well, how can the coal slurry pipeline though come in and get the traffic if they cannot show a cost advantage?

Mr. **DEMPSEY**. What they will do will be to enter into contracts with coal customers. They will be 25-, 30-year take-and-pay contracts, and they will have the traffic then. I mean, that is the whole purpose of this bill.

The **CHAIRMAN**. How can they do that though? How can they afford to come in and issue bonds and all that when they have got no cost advantage?

Mr. **DEMPSEY**. When they have no cost advantage. I am not sure that I follow, Mr. Chairman.

The **CHAIRMAN**. Well, in order to get business from the railroads to the coal slurry pipelines, they are not doing that as an act of friendship.

Mr. **DEMPSEY**. Right.

The **CHAIRMAN**. They are doing it as a cold, hard competitive matter in the marketplace.

Mr. **DEMPSEY**. Yes.

The **CHAIRMAN**. They want to go to the coal slurry pipeline because they have lower rates.

Now, if the coal slurry pipelines do not and, in effect, cannot have lower rates because railroads are entitled by the ICC rules to have the same low rates, how do the railroads lose the jobs to the coal slurry pipelines?

Mr. **DEMPSEY**. Well, the coal slurry pipelines might very well not be able to compete. And indeed, in the case of Arkansas Power & Light, as you pointed out, they were not able to compete. And that is, of course, our hope.

But on the other hand, it is the point of view of the advocates of the bill that they will be able to compete and compete effectively because they have a cost advantage, and they will be able to drive the rail rates down below what the railroad would otherwise would have to—would be able to charge.

Now, if that happens in the current regulatory environment, it may very well mean that the railroads can't move that traffic.

That is the result. If you drive the rail rates down by virtue of the regulatory environment below 100 percent of variable costs, then the rails are just out of that business. That's all.

The CHAIRMAN. There is a non sequitur here somewhere that coal slurry pipelines are driving rail rates down when you tell me that rail rates have already been driven down by ICC rule to whatever the coal slurry pipeline—

Mr. DEMPSEY. No, no, no. I have not said that they have been driven down. What I say——

The CHAIRMAN. Entitled to be.

Mr. DEMPSEY. What they are entitled to. That's right. Now, in the cases that have been litigated, the proponents of lower rates have not seen fit to try to make the coal slurry pipeline analogy. And I think that is because they probably cannot. That is to say, they cannot show that kind of cost advantage.

I leave, as I say, to Mr. Kilroy further discussion of the employment matter. Let me just say a word though about the impact on the rail industry because that is, of course, our principal concern. And it is, I understand, a matter of interest only as it affects the public interest. But the public, of course, is interested in the rail industry, and no one wants to revisit the 1970's.

You indicated, Mr. Chairman, that in your view the railroads are doing well. Well, they are not doing well. I have included in my testimony an elaborate prospectus on the economics of the rail industry.

The fact is that we had hoped that the Staggers Act would have rehabilitated the industry. And it certainly has helped a great deal. But our financial indicators are all down. We are earning now about 3.8 percent on net investment. You do better in a passbook savings account. Our net operating revenue is off 31 percent since 1980. The car loadings are down 13 percent.

And you can understand that. It is because we serve smokestack America by and large and agriculture. And grain exports are where they are. And coal is doing what it is doing, and steel is doing what it is—automobiles. And so, we follow our customers. Our customers are not doing very well, and we are not either. We are in trouble and we are anxious about the future of the industry.

Now, what would the impact of coal slurry pipelines be? It is speculative I am sure. But the OTA study remains the best of the disinterested studies of this entire issue that has been made, and so I will simply refer you to that study.

They concluded that if the pipelines then on the drawing boards were constructed, the industry would $700 million a year in net operating revenue. That is half—I won't even adjust for inflation. That is half of what our net operating revenue was last year.

That is a prescription for a disaster for the industry. And as Senator Conrad indicated, the results will be twofold. There will be a great pressure on the railroads to increase rates for other shippers. We won't be able to do that enough to make up that kind of a shortfall. There will be deteriorating service, higher rates. And assuming arguendo, that some large shippers and some large operators would benefit and the constituents in their service areas, the other people, the thousands and thousands of communities and shippers in the United States that depend upon the railroads would have higher rates and poorer service. That is our view. And that is why we oppose the bill.

Thank you very much.

[The prepared statement of Mr. Demspey follows:]

Statement of William H. Dempsey, President of the Association of American Railroads, Before the Senate Committee on Energy and Natural Resources on S. 801, the "Coal Distribution and Utilization Act of 1987"

September 10, 1987

Mr. Chairman and members of the Committee, I appreciate the opportunity to present the views of the Association of American Railroads on S. 801, the Coal Distribution and Utilization Act of 1987.

In considering S. 801, the Committee is revisiting one of the most debated transportation issues of the last ten years: Should the Federal Government confer the power of eminent domain on coal slurry pipeline companies? That question has been debated in six of the last seven Congresses and, when subjected to a vote, has been answered in the negative. With each Congress, the argument for granting the federal power of eminent domain to coal slurry pipelines has become less persuasive.

The power of eminent domain is to be exercised or conferred by government only where it is found necessary to take private property for public uses. Because private property rights are being infringed, eminent domain is a power to be exercised only when the public's need is a compelling one:

> It is a well-settled general principle that incidental benefits accruing to the public are not sufficient to make the purpose of an improvement or enterprise a public one. Thus, where the chief, dominating purpose or use is private, the mere fact that a public use or benefit is also incidentally derived will not warrant the exercise of eminent domain.*/

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*/ 26 Am. Jur. 2d, Eminent Domain §33 (1966).

The past attempts to enact legislation conferring the power of eminent domain on coal slurry pipeline companies have failed because quite plainly, "the chief, dominating purpose or use is private...." The absence of public purpose or use is even more evident today:

(1) There is no need for additional coal transportation capacity; and

(2) There is no need to construct slurry pipelines in order to constrain rail rates.

The disbenefits to the public, on the other hand, are substantial:

(1) Coal slurry pipelines will result in long-term employment losses;

(2) Coal slurry pipelines will impair the financial viability of the railroads and, ultimately, lead to poorer service at higher prices for most rail users;

(3) Coal slurry pipelines will hasten the depletion of one of our nations most scarce resources -- its water supply;

I will address briefly each of these points.

There Is No Need for Additional Transport Capacity

Domestic production of coal in 1986 was 888 million tons. The forecasts of domestic coal production through the year 2000 which we have reviewed range from 1.1 to 1.2 billion tons.*/ In

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*/ Wharton Econometrics forecasts 1.11 billion tons, National Coal Association forecasts 1.17 billion tons and Data Resources, Inc. forecasts 1.19 billion tons.

1986, the railroads hauled 518 million tons of coal or about 58 percent of domestic production. Assuming they retained the same market share, the railroads would be required to haul about 700 million tons in the year 2,000, or an increase of about 180 million tons.

In 1986, there was an average of 23,000 excess hopper cars available in the railroad fleet. Those cars represented a transport capacity of 64 million tons or more than a third of the capacity required by the year 2,000 forecasts of coal production. Only 40,000 additional cars would be needed to haul the rail share of the production forecast. Stretched over a ten-year period this would be a de minimus requirement since, in the last ten years, new rail car construction has ranged as high as 95,650. With this car-building capability, the industry could easily acquire the 4,000 new hopper cars that would be required on an average yearly basis.

There Is No Need to Construct Slurry Pipelines In Order to Constrain Rail Rates

The key argument made by coal slurry promoters has been that, without coal pipelines, rail coal rates would be unreasonably high because railroads do not face competition for the transportation of coal. The facts belie that argument. Far from being unreasonably high, in the six years since enactment of the Staggers Act, rail coal rates have failed even to keep pace with inflation and have actually declined by almost 4 percent in constant dollar terms. That decrease virtually mirrors the constant dollar decrease of 5% for rates on all rail commodities which has occurred during the same period.

Like the rates on all rail commodities, coal rates are kept in check by pervasive competition among railroads and between railroads and other modes of transport, by geographic and product competition, and by the potential competition that exists from all of these forms of competition. Indeed, under the Interstate Commerce Commission's Coal Rate Guidelines,*/ any price advantage a coal slurry pipeline might have can be realized by a shipper without the pipeline ever being built. There can be no more conclusive evidence that the construction of a coal slurry pipeline does not meet the public use test demanded by a grant of the eminent domain power.

In its Coal Rate Guidelines, the Commission adopted the concept of Constrained Market Pricing or "CMP," which it explained as follows:**/

> An important feature of CMP is that a captive coal shipper need not bear the costs of any facilities or services from which it derives no benefit. One means of assuring that such cross-subsidization does not occur is the "stand-alone cost" (SAC) test. This test is used to compute the rate a competitor in the market-place would need to charge in serving a captive shipper or a group of shippers who benefit from sharing joint and common costs. A rate level calculated by the SAC methodology represents the theoretical maximum rate that a railroad could levy on shippers without substantial diversion of traffic to a hypothetical competing service. It is, in other words, a simulated competitive price. (The competing service could be a shipper providing service for itself or a third party competing with the incumbent railroad for traffic. In either case, the SAC represents the minimum cost of an alternative to the service provided by the incumbent railroad.)

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*/ Ex Parte 347 (Sub-No. 1), Coal Rate Guidelines, Nationwide, decided August 8, 1985.

**/ Id. at 9.

In plain terms, under the Guidelines, any "captive" coal shipper that can show its rates would be lower if a coal slurry pipeline were built to serve it could force the railroad to lower its rate to the rate that the slurry pipeline would charge!

The importance of this regulatory standard to the coal slurry debate cannot be overstated. For over a decade slurry promoters have been asserting that pipeline rates would be lower than railroad rates if pipelines were built. The ICC has now provided that a railroad cannot charge a shipper more than a slurry pipeline (or any other competitor) would charge that shipper. If, indeed, a coal slurry pipeline would provide cheaper transportation, coal shippers can now force railroads to reduce their rates to coal pipeline levels without incurring the risk of a long term take or pay pipeline contract. There is no need, therefore, to build a pipeline in order to get the competitive advantages of a pipeline. Under any scenario a coal pipeline would only add redundant transportation capacity and its construction would do nothing to constrain rail rates that could not be done without its construction -- it would utterly fail the public use test for condemnations of private property.

I would now like to review the public disbenefits which also argue against any grant of federal eminent domain authority to coal slurry pipelines.

Coal Slurry Pipelines Will Result in Long-Term Employment Losses

Coal slurry pipeline proponents continue to justify federal assistance on the ground that coal slurry pipelines will ease the unemployment problem. Supporters of the eminent domain bill pending in the House assert that pipelines would create 370,000 jobs. While the source of that figure is not disclosed, one can surmise that it was generated by the same process as the figure of 500,000 jobs which pipeline promoters were claiming in the 98th Congress. That figure, we found, was derived by plugging into the Bureau of Labor Statistic's model for estimating the effects of revenue increases on various segments of the national economy -- in this case heavy construction -- the estimated amount of money needed to construct proposed pipelines . By doing so, one generates the number of job-years that would be needed to construct planned pipelines. So, evidently, using the BLS methodology pipeline proponents have calculated that slurry pipelines will create 370,000 job-years. It is to be noted that this is the total number of job-years it would take to build the slurry pipelines -- it is not 370,000 jobs per year. These jobs would disappear as soon as the pipelines were built, never to reappear.

The adverse long term effect slurry pipelines would have on unemployment offsets by far the 370,000 job-years that supposedly would be required to build slurry pipelines. In its 1978 report on coal slurry pipelines, the Office of Technology Assessment stated that six permanent railroad jobs would be lost for every permanent slurry pipeline job created.*/ Furthermore, even during the period of construction of slurry pipeline, jobs associated with the railroad industry would be lost due to discontinued construction of hopper cars and locomotives and track improvements associated with the tonnage of coal that slurry pipelines would divert from rail. In 1983, based on pipelines then projected to be built, we calculated the total of job-years lost to be in excess of 1.8 million.

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*/ Office of Technology Assessment, A Technological Assessment of Coal Pipelines, (1978), pp 77, 78.

It also should be noted that slurry pipelines would seriously affect coal miners. These pipelines generally would serve the largest mines in a few areas. Smaller, more labor intensive mines would become less competitive than those served by pipelines because their rail rates would increase as railroads sought to recover revenues lost by the diversion of traffic to pipelines.

Coal Slurry Pipelines Will Impair the Financial Viability of the Railroads And, Ultimately, Lead to Poorer Service At Higher Prices For Most Rail Users

Coal slurry pipelines are economically most attractive at long distances and high volumes. That is, of course, also true of rail operations. Consequently, the pipelines would skim the railroads' most profitable traffic, and do so without incurring the railroads' common carrier obligations to serve all shippers.

Taking away the railroads' most profitable services and requiring them to continue their less profitable services can only lead to deteriorating rail services and increasing rates. The specter of deteriorating railroads should be of paramount concern to the Congress since it spent most of the decade of the 1970's seeking ways to make railroads economically viable.

This specter is not raised only by me for the purpose of this hearing. The OTA estimated that the pipelines planned at the time of its study would result in a net revenue loss to the railroads of approximately $700 million annually -- a figure equal to 60 percent of the industry's net operating income in 1986. Losses of such magnitude could not possibly be recouped through rail rate increases and could only result in the service deteriorations and bankruptcies that marked the 1970's.

Attachment I to this testimony is a report the Association published last June on the state of the railroad industry. As the report shows, the economic condition of the industry is not good. Net railroad income from operations has been flat since the Staggers Act and, adjusted for inflation, dropped 31 percent from 1980 to 1986. The industry's return on investment in 1981 was a meager 4.0 percent and in 1986 was even lower -- 3.5 percent. Its return on equity in 1985 was 6.8 percent as compared to figures of 11.5 percent for all U.S. industry and 14.4 percent for electric utilities.

There is, plainly, justifiable doubt as to the industry's long-run viability. The threat to viability comes from downward trends in tonnage and profits, increasing competition, high labor costs, and federal subsidies to competitive modes. The latter two of these threats are directly attributable to past actions of the Federal Government. Insofar as the railroad industry is concerned, it seems quite clear that the time has come for federal forbearance in attempting to influence the workings of the surface transportation marketplace. This would seem to be especially true of legislation such as S. 801 which would have the effect of encouraging new investment in unneeded coal transporting capacity and further imperiling the investment in existing capacity.

Coal Slurry Pipelines Will Hasten The Depletion Of One Of Our Nation's Most Scarce Resources -- Its Water Supply

While coal slurry pipelines would wreak havoc on the railroad industry, they similarly would have a serious impact on the nation's water supplies.[*/] The immense amount of water required by slurry pipelines has been described in detail over the years. The basic requirement is a ton of water for a ton of coal. A 55 million ton per year pipeline would, for example, consume the entire flow of the Potomac River for one week.

The 1978 OTA study noted that in each of the pipeline origin areas it studied, except one, projected demands for water exceeded supply. It concluded that "a coal slurry pipeline could use surface water only at the expense of growth in the existing and new uses."[**/] Those major competing uses would be agriculture and energy-related industries. If the federal government is going to establish a policy of encouraging the creation of large new water consuming entities in the face of water supplies already inadequate to competing demands, the national interest served thereby should be more compelling than any advanced thus far in behalf of coal slurry pipelines.

While S. 801 purports to give states control over the diversion of water to coal slurry uses originating in a state, it does

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[*/] I understand that transport mediums other than water are being explored but that their economic feasibility has not yet been demonstrated.

[**/] At 90.

nothing for the affected "downstream" states.**/ Those states -- who share the aquifers with states willing to sell water -- have no power to protect themselves under the bill even though they may find that tremendous quantities of their water supplies are being drawn for projects which adversely affect their citizens. S. 801 would take from those states the only remaining power they have to protect their water supplies -- attaching conditions to any grant of eminent domain to a coal slurry pipeline. No stronger argument exists for leaving the exercise of eminent domain powers in the hands of the states.

To sum up, any potential public benefits flowing from the construction of coal slurry pipelines fall far short of the quantity needed to justify a grant from the Federal Government of the power of eminent domain. The plain, unalterable fact is that there is no transportation requirement to be met by coal slurry pipelines. All present and projected demands for the transportation of coal can be met by the railroad industry at prices competitive with coal slurry. And a regulatory system is in place which assures that competitive prices will prevail. The disbenefits flowing from the construction of coal slurry pipelines are, on the other hand, substantial and numerous. Clearly, the Congress should continue to stay its hand in this matter.

**/ Several other things the bill does not do are worth mentioning: (1) It does not explicitly require the Secretary of Energy, in granting the power of eminent domain, to consider the effect of coal slurry on water supplies or other carriers; (2) It does not subject coal slurry to safety regulation by the Department of Transportation; and (3) It does not place the obligations of a common carrier on a coal slurry operator.

America's Railroads After Staggers:

an economic prospectus

ASSOCIATION OF
AMERICAN RAILROADS
June 3, 1987

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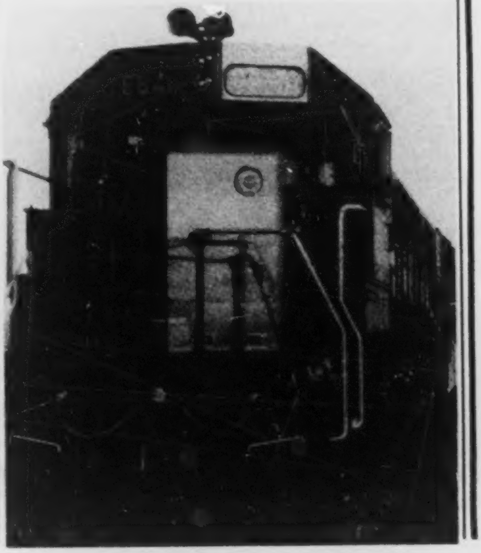


EXECUTIVE SUMMARY

This paper is prompted by the prospect that the 100th Congress will, in all likelihood, dictate the future role of the American railroad industry.

With its seemingly inevitable decline arrested during the early 1980's, the industry has been able to withstand serious problems and contribute, as it should, to an efficient and competitive transportation network.

This resiliency, while notable, must not be overstated. America's freight railroads still face deep-seated problems. The profitability of the industry has been steadily declining; when adjusted for inflation, railroad operating earnings have dropped nearly one-third between 1980 and 1986. The industry remains unable to earn its current cost of capital. In fact, railroad return on investment in 1986 was actually lower than the level recorded for 1980 when Congress authorized a partial deregulation of the industry. All told, analysis of current rail problems shows them to be so severe as to dispel the false perception that the industry can endure a new set of economic handicaps imposed by Federal policy. In fact, existing Federal laws that place special burdens on the railroads are sorely in need of change.

The collapse of the industry was avoided during the early 1980's because Federal policies finally gave railroad managers the tools to cope with an increasingly difficult business environment. The Staggers Act of 1980 increased the permissible range of action managers could take to improve revenues and reduce costs. The Economic Recovery Tax Act of 1981 materially enhanced cash flows. And the railroads have aggressively sought to improve productivity and remain competitive.

The Market Place Environment

Some of those tools are gone; indeed, the new tax structure creates great uncertainties for capital-intensive, cyclical industries such as the railroads and their most important customers. Yet the business environment continues to pose challenges on all sides. Much of the railroads' traditional base — steel, heavy manufacturing — has substantially eroded in the face of foreign competition and changing demands. American exports of coal and grain have similarly been hard hit, with a resulting decrease in rail-served movements.

The dynamics of the transportation market make it increasingly difficult for railroads to maintain healthy competition with trucks and barges. Changes in logistics, such as just-in-time inventory, favor the flexibility of service that trucks can offer. Downsizing of products and product substitution have also reduced the call for rail service. Substantial breakthroughs in truck productivity, many enhanced by Government, exert strong downward pressure on railroad pricing. Some proposals to increase truck sizes and weights could require the railroads to lower their rates to a level where they would lose some 65 percent of their pre-tax net operating revenues. Similar pressures obtain on barge-competitive traffic as a result of a chronic and persistent overcapacity of barge equipment.

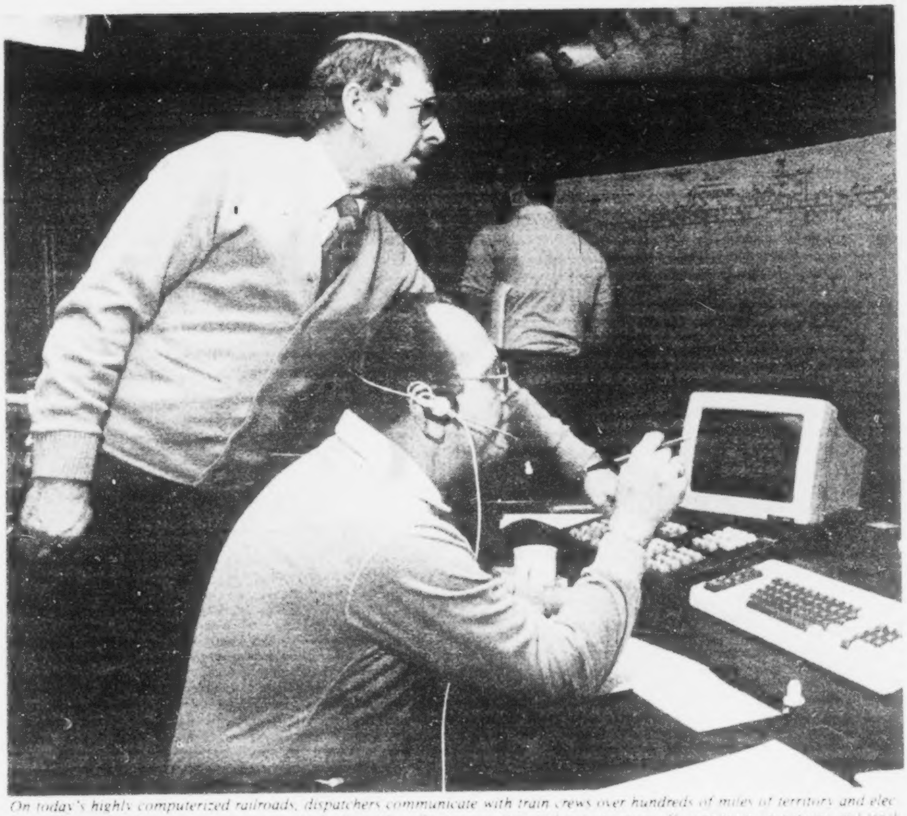
Facing little or no growth in their traditional customer base and stiff intermodal competition, railroads can anticipate no major relief on the revenue side. Rate compression will characterize the industry for the foreseeable future. If railroads are to continue to serve the economy as healthy enterprises, therefore, they must take dramatic steps to reduce costs and must invest heavily in new technology to improve productivity.

Thus far they have been able to respond. A significant trend towards the development of total transportation companies is emerging. Plant and equipment capacity has been tailored to new needs. The industry is actively working on new technology promoting efficiency. Quality service and its companion, safety of operations, have shown dramatic improvements. Yet much more will need to be done in the near future if the railroads are to exist on other than survival rations.

The Legislative Environment

If the industry already faces a herculean challenge to remain viable, a variety of proposals before the Congress would so alter the balance as to make the odds impossible. Measures have been advanced to reduce rail rates, to impose heavy new costs on the industry's retirement system, and to prevent the industry from transferring light-density operations to lower-cost carriers. A tacit assumption underlying all these measures is the myth that railroads can recoup the cost of these proposed Government-imposed burdens from the market place. That myth ignores the realities of the commercial world.

Far from being able to absorb a new set of economic handicaps, the railroads need greater relief from Government in many areas. Public programs are structured to favor truck and barge competition unfairly. The railroads — and their employees — suffer from an outmoded method of compensating workers for on-the-job injuries. The rail industry is not immunized against secondary picketing, unlike business generally. A new look must be taken at a whole range of Federal policies that have lost their relevancy.



On today's highly computerized railroads, dispatchers communicate with train crews over hundreds of miles of territory and electronically switch distant trains from one track to another. Computers plan and execute more efficient train operations and track maintenance, resulting in reduced fuel consumption and improved on-time performance. (Photo by Bob Wojcieszak, Norfolk Southern Corporation.)

If, on the contrary, Congress imposes an even more hostile governmental environment, railroad managers would have few choices; some indeed would have none. Access to the capital markets would essentially be denied and internally generated cash would be the exclusive source for maintaining the physical integrity of the system.

Faced with a similar dilemma, railroad managers in the late 1960's and 1970's, restrained by Federal policy from cutting costs, could only resort to across the board rate increases. Because railroads had long lost their market strength against other modes, this course led to massive diversions of traffic which further aggravated the cash shortfall. For many companies this ultimately meant deferred maintenance, for some, bankruptcy or liquidation. Shippers received poorer service at higher cost.

To avoid repeating that scenario in the 1980's and 1990's, those railroads that could would shrink to truncated core systems, operating mileage well below anything presently contemplated. Many communities and shippers would be deprived of rail transportation. If even that avenue of relief were denied, by law, the economic viability of the industry in the private sector would be ended.

The alternative is simple: the legislative scales must be balanced to permit the railroad industry to meet its challenges and to contribute to the nation's economic well being.

INTRODUCTION

The year 1987 marks a century of Federal regulation of the American railroad industry.[1] The original impetus for Government involvement was based on an economic fact: many railroads possessed extensive monopoly powers which the public interest required be watched and checked.

During the days of railroad hegemony in transportation, the scope of economic regulation was expanded and a host of other Federal measures enacted. Commonly, these other measures also reflected the realities of the times: the essentiality of railroads, their basically interstate character and the absence, in the early years, of adequate state and Federal laws dealing with the problems of an industrialized society. As a result, there evolved a whole system of Federal laws unique to railroads.[2]

America's railroads have long since lost the monopoly power of yesteryear — an economic fact hastened by Government stimulation of other transport technologies through such massive programs as the Interstate Highway and Inland Waterway systems.[3] Yet as practices took root and interests became vested, the pervasive involvement of Government in the railroad industry underwent no concomitant change.

In the 1970's, the conflict between the Federal view of the railroad industry, as expressed in law and regulation, and the real world, as witnessed in the competitive arena, became irreconcilable. The economic malaise in American railroading spread from New England to the far Midwest, with major bankruptcies affecting service in some 30 states covering one-fifth of the nation's rail lines.[4] The equity markets were closed to the industry and survival became a function of rate increases and deferred maintenance.[5] By the end of the decade, the industry was becoming a wasting national asset destined for liquidation or nationalization.

In the face of sure disaster, Government issued a number of prescriptions, some innovative, some conventional, ranging from take-overs to cash infusions.[6] None addressed the inherent conflict between the political environment and the economic reality. Because of that, the panic deepened.

The immediate crisis was averted only when Government concentrated on the economic realities. The Staggers Act of 1980 contained no subsidies, but simply eased some of the constraints on railroad marketing efforts.[7] On a case-specific basis, the Northeast Rail Services Act of 1981 permitted Conrail to cease functioning solely as a subsidized instrument of social policy and to respond on its own initiative to its business challenges.[8]

The Staggers Act was, and is, no cure-all. It dealt only with economic regulation under the Interstate Commerce Act, and then solely with that law's most egregiously obsolete provisions. Without by any means "deregulating" the industry, the Act did expand the zone of self-help within which management could operate.[9] Most notably, rail managers could respond to price and service competition and begin to shed unproductive plant. At the same time, the Economic Recovery Tax Act of 1981, which affected all American industry, materially enhanced the cash flow resources available to railroads for a five year period.[10] These measures generated a substantial reinvestment in plant and increased productivity with noticeable benefits to the public in terms of better service and lower costs.[11]

As the 1980's come to a close, there arises again the prospect of a fatal conflict between the economic realities facing the railroad industry and political perceptions. In a world of declining business and increasing competition, railroad managers are struggling to maintain adequate revenue-cost margins.

By contrast, the view from Washington too often ignores commercial realities. On the marketing side, a number of proposals advanced during the 99th Congress would have rescinded the major breakthrough created by the Staggers Act: demand-based pricing.[12] On the cost side, a serious effort was mounted to block the potential for productivity gains by attempts to discourage sales to regional operators of light-density lines which might otherwise be abandoned.[13]

The 100th Congress will be asked to revisit these issues as well as a number of others affecting the railroads, their employees and the shipping public.[14] The purpose of this paper is not one of advocacy on specific areas of controversy. Rather, it is to describe the economic environment in which these public policy questions should be evaluated. The facts suggest that if public policy should be changed, the direction should be to assist the railroad industry in being treated like business in general, and not to add new legislative and regulatory burdens.

I
THE INDUSTRY TODAY

Importance to the Nation

The efficient movement of our products and goods, both in domestic and foreign commerce, is critical to American competitiveness. The nation's highway, waterway and rail networks have important roles to play; indeed, healthy competition among them exerts strong downward pressures on prices. It is a tribute to railroad technology that it can compete with other modes enjoying the benefits of operating exclusively on publicly owned rights of way.

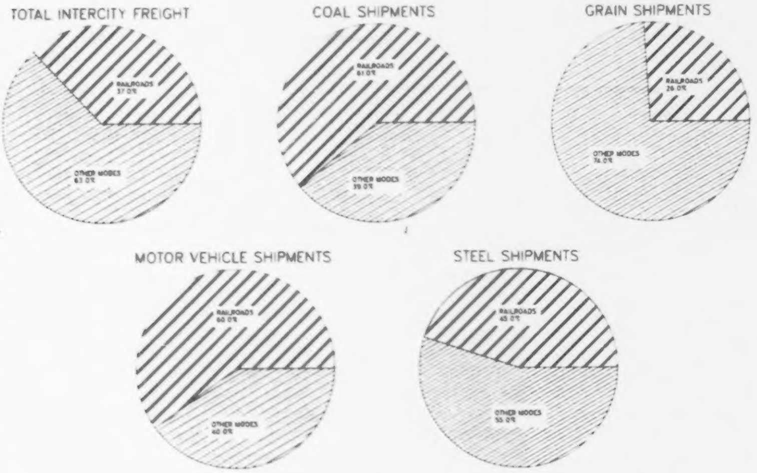
According to the most recent figures, railroads account for 37 percent of the intercity freight transportation in the United States.[1] They move 45 percent of total steel shipments and 60 percent of motor vehicles shipped from U.S. assembly plants.[2]

Railroads are the major transporters of coal in the U.S. and, because of their operating efficiency, make a significant contribution to low-cost energy. In 1985, railroads handled 61 percent of the 886 million tons of coal produced in this country, and did so at relatively low cost: while coal traffic accounts for 41 percent of total railroad tonnage, it represents only 23 percent of railroad revenue.[3] Furthermore, railroad revenue per ton-mile of coal traffic increased by only .15 cent from 1980 to 1985 (from 2.18 cents to 2.33 cents), reflecting an 18 percent decline in constant dollar terms.[4]

Coal offers a good example of how legislation can assist both shippers and carriers to effect economies and efficiencies. The Staggers Act of 1980 authorized railroads to offer contract rates, in effect volume discounts for guaranteed shipments.[5] The railroad is assured minimum volumes which assists it in capital budgeting and operations planning, and the shipper may rely on a given rate. At last count, 62 percent of coal movements was governed by contract rates.[6]

Railroads provide much of the transportation essential to the agricultural community, with special emphasis on grain movements. In 1985, railroads moved 1.2 million carloads of grain, representing 26 percent of the U.S. grain transportation market that year.[7] Although U.S. export grain sales in 1985 were their lowest since 1977, the railroad industry still moved 1.4 billion bushels of export grain — 41 percent of all grain exports.[8] Primarily through the development of innovative contracts, grain rates have dropped an average 29 percent since 1980, a period of extreme difficulty for many U.S. farmers.[9] By late 1986, some 63 percent of grain shipments by rail moved under contract rates.[10]

1985 RAILROAD MARKET SHARES


TOTAL INTERCITY FREIGHT

COAL SHIPMENTS

GRAIN SHIPMENTS

MOTOR VEHICLE SHIPMENTS

STEEL SHIPMENTS

Because they serve so much of the nation's economy, railroads constitute a major industry in and of themselves. Railroading is a capital-intensive business that fuels the economy with significant capital outlays. Railroad net investment totaled over $46 billion in 1985 and capital expenditures in that year amounted to $4.4 billion; in addition, the industry spent $10.7 billion for maintenance of plant and equipment.[11] The nation's freight railroads offer direct employment to some 274,000 men and women.[12] The industry is a major factor in the money markets: shareholders' equity is $27.6 billion; equipment debt totals $4.4 billion and other fixed debt amounts to $7 billion.[13]

It is a genuine source of national pride that the American rail freight system is by far the largest privately owned rail network in the world.

Financial Performance

The Staggers Act of 1980 greatly enhanced the ability of railroad managers to engage in self-help measures to implement much needed internal restructuring, to meet competitive pressures, and to conform commercial practices to business necessities.[14] In addition, the Economic Recovery Tax Act of 1981 materially increased cash flow.[15]

While these measures averted collapse, the rail industry remains, by any financial criterion, a troubled one. On a comparable betterment accounting basis*, net railroad income from operations has been flat since the Staggers Act, and, when adjusted for inflation, dropped 31 percent from 1980 to 1986.[16] Using depreciation accounting, the decline has been 28 percent since 1984, exclusive of major writedowns and other special charges, even before adjusting for inflation.[17]

When measured by the basic test of long-run economic viability — a return on investment equivalent to the current cost of capital — the rail industry's problems become evident.

In 1980, the industry posted a 4.2 percent return on investment (ROI); on a comparable accounting basis, ROI has fallen below the 1980 level in five of the past six years.[18] For the years 1981 through 1986, the industry's ROI continued to trail its current cost of capital.[19]

RETURN ON INVESTMENT VS. COST OF CAPITAL

	1981	1982	1983	1984	1985	1986
ROI	4.0%	2.1%	3.6%	4.7%	3.6%	3.5%
Cost of Capital	16.5	17.7	15.3	15.8	13.6	N/A

(N/A — not available)

The railroads' return on equity (ROE) for the years 1981 through 1986 was equally deficient when compared with that of the electric utility industry or all of American industry.[20]

RETURN ON EQUITY

	1981	1982	1983	1984	1985	1986
Elec. utilities	12.4%	13.2%	14.3%	14.9%	14.4%	N/A
Railroads	10.5	5.4	7.3	9.9	6.8	2.1
All Industry	13.8	10.9	10.6	13.5	11.5	11.6

In 1985, railroad ROE ranked dead last as compared with the 25 industries in the Fortune 500.[21]

These poor profit results have been reflected in the equity markets. From 1981 through 1986, the Standard & Poor Rail Index dramatically underperformed other leading stock indices, with the S&P Electric Utility index rising over four times faster than the Rail Index, and the Dow Jones Industrials and Transportation Indices advancing more than three times as fast.[22]

PERCENT CHANGES IN YEAR END STOCK INDICES (1980-1986)

S&P Rail	S&P 500	S&P Trans.	S&P Elec. Util.	DJ Indus.	DJ Trans.	DJ Util.
+ 27	+ 78	+ 56	+ 114	+ 97	+ 103	+ 80

In short, rail earnings have not improved since Staggers and remain well short of what the industry needs for long-term viability and what other industries are achieving. Post-Staggers results provide modest comfort only when compared to the totally unacceptable pre-Staggers returns on investment of 1.60 percent in 1976, 1.24 percent in 1977, and 1.58 percent in 1978.[23]

To be sure, the industry has generally improved its cash flow picture from the dismal results of 1980.[24] That development does not, however, assure a long-term turnaround. On the contrary, the improvement largely reflects the benefits of the Economic Recovery Tax Act of 1981. The single most significant cash-flow benefit of that Act was to allow, for tax purposes, rapid depreciation of an investment base in track which the railroads had not been permitted to depreciate under the previous system of tax accounting.[25] This previously "frozen" base was allowed to be written off rapidly, using an accelerated five-year method. Over the 1981-85 period, this feature added a one-time increase in cash flow of an estimated $2.5 billion.[26]

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*In 1983, the industry converted from its traditional retirement-replacement betterment (RRB) accounting system for track expenditures to a depreciation system. Up to 1986, The ICC still required railroads to state Net Railway Operating Income (NROI) under both betterment accounting and depreciation accounting systems. Since no financial results on the depreciation system are available prior to 1983, NROI based on the RRB system is the only measure of railroad income reported on the same basis from 1980 to 1986.

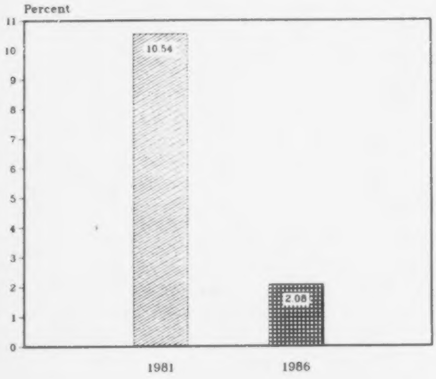
Cash flow also benefitted from lower levels of certain equipment purchases due to an oversupply of cars owned by private investors, often as tax shelters, depressed business levels, and productivity gains.

The tax benefits have ended. Indeed the Tax Reform Act of 1986 is expected to have a deleterious effect on cyclical, capital-intensive industries such as the railroads.[27] The principal causes of this assessment are elimination of the investment tax credit, implementation of a harsher minimum tax which will apply in years of depressed earnings, and stretched-out depreciation schedules for rail equipment and structures. Furthermore, these same tax features will be negative for many of the railroads' capital-intensive industrial customers, and, thus, threaten a decline in rail movements.

As the industry works through its surplus equipment stage, cash outlays for new equipment requirements will have to increase.

In sum, the financial position of the industry has been slipping, and, owing to the business factors described in the next Section, will face adverse pressures in the years ahead.

RAILROAD RETURN ON EQUITY



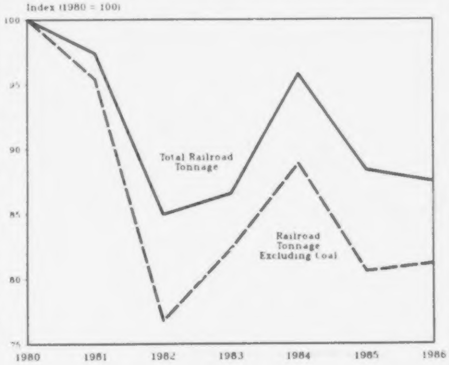
II
TRAFFIC LEVELS AND COMPETITIVE PRESSURES

While many factors such as tax incentives, or disincentives, affect railroad financial performance, the core of analysis for the industry's future prospects must start with its traffic base. In this regard, changes in the market over the past few years have resulted in a loss of traffic as well as market share. At the same time, truck and barge competition has intensified, cutting into profit margins on competitive traffic.

Traffic Decline and Shift in Consist

From 1980 to 1986, total railroad tonnage dropped by 13 percent; more alarming, if coal is excluded, railroad tonnage was down by 19 percent.[1] Coal movements are of obvious benefit to the industry, but many railroad companies rely more heavily than the major coal carriers on other sources of traffic.

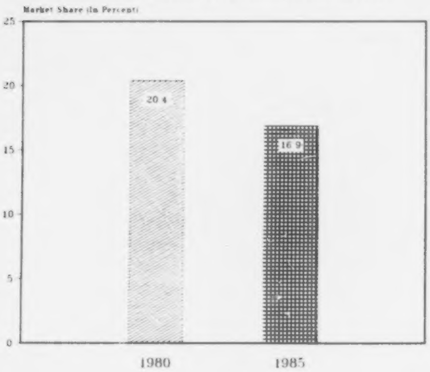
RAILROAD TONNAGE ORIGINATED



These developments reflect some basic economic changes. Three major factors are discussed below: (1) a shift in the U.S. economy away from basic production; (2) a downsizing of many manufactured products as well as product substitution; and (3) unabated foreign competition for U.S. export markets.

Furthermore, truck competition has been enhanced as a result of truck deregulation, increased sizes and weights, markedly improved truck productivity in rail-competitive areas, and continued subsidization of the highway infrastructure. The effect of these factors is easily assessed. From 1980 to 1985, the railroads' share of the intercity freight market, measured in revenues, slipped from 20.4 to 16.9 percent — a loss of 3.5 percentage points.[2] At the same time, the truck share increased from 69.5 to 73.4 percent — an increase of 3.9 points.[3] Excess barge capacity has also generated an additional threat to rail-served freight.

RAILROAD SHARE OF FREIGHT REVENUES



Shift from Basic Production

The growth in the service segment of the American economy vis-a-vis its manufacturing activity is well documented and irreversible. The percentage of gross national product which is comprised of manufactured goods shrunk from 56.3 percent in 1950 to 39.8 percent in 1986; at the same time, the percentage attributable to services increased from 30.9 percent to 50.0 percent.[4] Obviously, this shift in growth patterns offers a pessimistic outlook for transporters of goods. Many of the industries showing no growth, or even declines, have traditionally relied on railroads for much of their transportation; these include iron and steel, ferroalloy and copper ore mining, stone and clay quarrying, forgings, and nonferrous metals and products.

Downsizing of Products and Product Substitution

Another factor affecting the competitive pressures on railroad traffic is that products are becoming smaller and lighter. There are numerous cases where aluminum and plastics are substituted for steel, plastics for wood, and plexiglass for glass. Miniaturization is common in many American products today, especially impacting the manufacture of steel and the raw materials — iron ore, coking coal and limestone — necessary for steel's production.

A combination of these developments has manifested itself in the production of smaller and lighter automobiles, another major component of the rail industry's traffic base. A reduction of 18 percent in the basic steel component of automobiles has been predicted by 1995.[5] The average weight of passenger cars sold in the U.S. has already declined from 3,627 pounds in 1978 to 2,866 pounds in 1985.[6]

Erosion of steel usage has also occurred in the container and oil-drilling industries — trends likely to continue.[7] Obviously, these developments spell less transportation and less rail revenues.

The Challenge in International Trade

Recent declines in American exports of coal and agricultural products have seriously hurt rail business. Coal exports surged from 1978 through 1981 as a result of escalating oil prices and political problems in other coal exporting countries. But by 1981, exports began on a downward slope along with oil prices. An upturn in 1986 still left coal exports short of prior year highs. These developments reflected marked changes in the pattern of international coal distribution including the emergence of new low-cost coal producers, the resurgence of traditional competitive sources, and the relatively high cost of U.S. coal at mine mouth. From 1981 to 1985, export coal tonnage increased by 77 percent from Australia (to the point where Australia matched U.S. export levels), 75 percent from Canada, and 48 percent from South Africa. At the same time, a resurgence of Polish coal production occurred. All of this took place during a period of lowered demand for steel which hurt U.S. metallurgical coal production.[8]

Another major railroad commodity experiencing a decline in exports has been grain. In fact, total U.S. grain exports for 1985 were more than 21 percent below the 1984 level and were at the lowest level since 1977.[9] Exports in 1985 equalled 22.4 percent of U.S. grain production, as contrasted with 31.7 percent the previous year.[10]

Finally, two other railroad markets facing international challenges are steel and automobiles. With lower labor costs and higher productivity, foreign producers captured a 16 percent share of the U.S. steel market in 1980, 22 percent in 1982, and 25 percent in 1985.[11] This development was exacerbated by a general decline in steel demand, noted above, brought about largely by reduced construction and broader use of substitute materials such as plastics and aluminum.

In the case of automobiles, the growth of foreign competition has had a generally adverse effect on the railroad industry. To the extent foreign producers build their vehicles outside the U.S., railroads can benefit from the relatively long hauls from port to market. On balance, however, this advantage is far from enough to offset the loss of traffic associated with the domestic manufacture of motor vehicles. This is particularly true since rail transportation normally associated with an American-made car involves multiple movements: raw materials inbound, finished components out to assembly plants, and finished vehicles from assembly plant to market.

Truck Competition

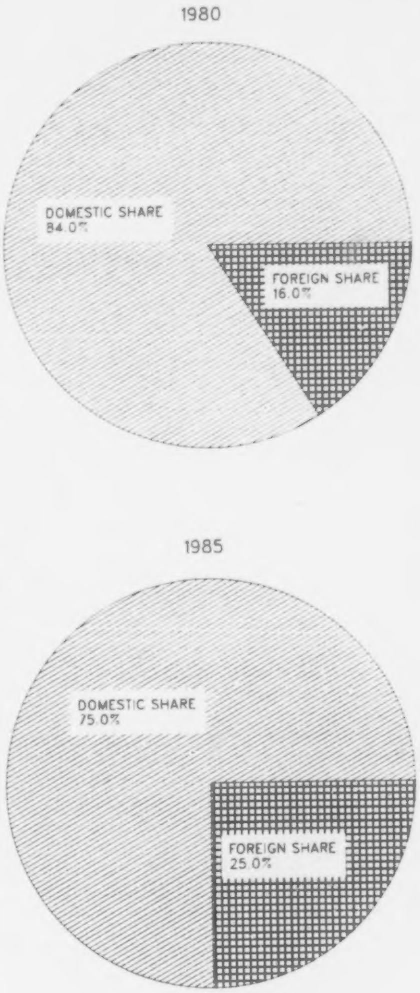
With the virtual completion of the Federal Interstate Highway System, partial deregulation of the trucking industry, increases in permissible sizes and weights, and the decline in fuel costs, truck competition has greatly intensified in scope and effectiveness.[12] Furthermore, many truckload carriers have recently made efficiency breakthroughs which should have a major adverse effect on railroads in future years.

As manufacturing industries pare costs, they are demanding premium quality freight transportation service to meet just-in-time goals of minimizing inventory carrying and storage costs.[13]

The trucking industry has traditionally provided higher service quality. Trucks permit smaller inventory levels and greater flexibility in inventory management. Consequently, a shipper's inventory and storage costs are typically lower when using truck compared to rail. To offset this disadvantage, railroads must usually charge lower freight rates. As the trucking industry continues to improve service quality, the railroads must work even harder on lowering operating costs and improving their own service.

While the Staggers Act of 1980 was primarily designed to improve the rail industry's weak earnings, the Motor Carrier Act of 1980 was intended to stimulate competition.[14] The success of the Act in that regard is reflected in the evolution of Advanced Truckload Firms (ATLF's) — a group of dynamic, rapidly growing motor carriers in the rail-competitive truckload sector.[15] With 24-hour, 7 day-a-week dispatching, extra trailer capacity made possible by subsequent Federal legislation and multiple pickups and deliveries, ATLF's provide premium quality truck service. As service becomes more important, current ATLF's and their growing number of imitators will become even stronger competitors.

FOREIGN STEEL PRODUCERS' SHARE OF U.S. STEEL MARKET



Along with improvements in truckload service quality, costs and rates have fallen. In mid-1986, the typical truckload long-run marginal cost was $1.03 per loaded mile.[16] By contrast, the typical ATLF long-run marginal cost was $.90 per loaded mile, a 12.4 percent reduction.[17] A similar difference was evidenced between the two in per ton-mile costs, from $.0540 to $.0473 per ton-mile.[18] As truckload rates fall, reflecting these cost reductions, rail rates must also decline to remain competitive.

The most important reason for the cost decline is improved capital productivity. Equipment costs have fallen because of higher annual tractor utilization, volume discounts, and improved empty/loaded ratios.[19] At the same time, ATLF's enjoy labor costs significantly lower than those of the railroad industry. Average annual compensation for an ATLF employee is about $34,000;[20] rail labor's average annual compensation is over $46,000.[21]

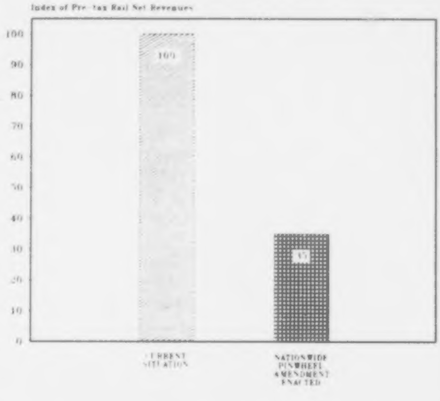
Finally, total fuel costs have been declining. Between 1980 and 1985, fuel consumption for the average long-haul truckload went from 4.7 mpg to 5.5 mpg.[22] At the same time, of course, fuel prices have dropped 50 percent from their peak in 1981.[23] Once more, these results favor trucking over rail, since fuel represents a higher percentage of rail-competitive trucking costs than it does of rail costs.[24]

Further, truck productivity has not reached full potential. The best tractors now on the market are capable of attaining 6.2 miles per gallon, almost 13 percent better than the current long-haul average.[25] By 1990, if current trends continue, the average long-haul truckload truck will achieve 126,816 annual loaded miles.[26] That would represent a cumulative improvement of 7.9 percent over the 1985 level.[27] ATLF capital productivity is rising even faster. Projections for a typical ATLF indicates that by 1990, annual loaded miles will reach 157,000, a 24 percent gain over 1985.[28]

Still greater efficiency gains would be possible under changed vehicle size and weight limits. For example, a proposal was made to Congress in 1986 that weight limits in 17 western states be increased to Bridge Formula B (BFB) levels — the so-called "Pinwheel" plan.[29]

Apart from environmental and safety issues, the effects of this proposal on the railroad industry would be devastating. On the basis of 1985 figures, in order to meet lowered truck rates made possible by truck efficiency gains already realizable, ATLF operations plus nationwide implementation of the BFB formula, the railroads would have had to depress their own rates to a point where they would have lost about 65 percent of their 1985 pretax net operating revenues — or some $1.5 billion. Principal losses would be in transportation equipment, chemicals, construction materials, pulp and paper, and food products.[30] Over the long term, the railroads would have begun losing traffic comprising 13 percent of ton-miles carried in 1985, because continued operations could simply not be justified at the lower rate levels.[31]

ENACTMENT OF NATIONWIDE PINWHEEL
AMENDMENT ON SIZE AND WEIGHTS
COULD SIGNIFICANTLY REDUCE RAILROAD NET REVENUES



From the standpoint of public policy, the issue is not that truck efficiency gains harm railroads. To the degree that improved truck efficiencies reflect a real cost advantage, railroads are entitled to no government shelter. But a significant part of trucking's growing competitive advantage reflects an unfair discrimination in treatment between the modes as a result of government subsidy of the railroads' competitors.

The subsidy comes about because heavy trucks are permitted to pay user charges far below the level necessary to compensate for the wear and tear they cause on the public highways. A Federal Highway Administration estimate based on the 1982 Federal Highway Cost Allocation Study showed that the *average* heavy truck (of 75,000 pounds or more gross vehicle weight) paid only 65 percent of its cost responsibility.[32] A number of studies conducted on the state level revealed comparable levels of underpayment.

Heavy trucks that now compete directly with the rails probably pay as little as 50 percent of their Federal highway cost responsibility and, under proposed Federal weight increases, some would pay only

40 percent of their fair share.[33] On the other hand, full cost recovery, at current weight limits, would essentially equalize the competitive costs between railroads and their most effective competitors, the ATLF's.[34]

If in addition, however, ATLF's were permitted to operate nationwide at BFB levels and to haul twin 48-foot trailers, railroad net revenues would still be substantially imperilled.[35] Stated in 1985 terms, the rail industry would have lost about half of the $1.5 billion stated above.[36] This factor shows the challenge ahead: even on terms of parity, the railroads will have to make substantial improvements in productivity to keep abreast of what the future may bring in terms of truck competition.

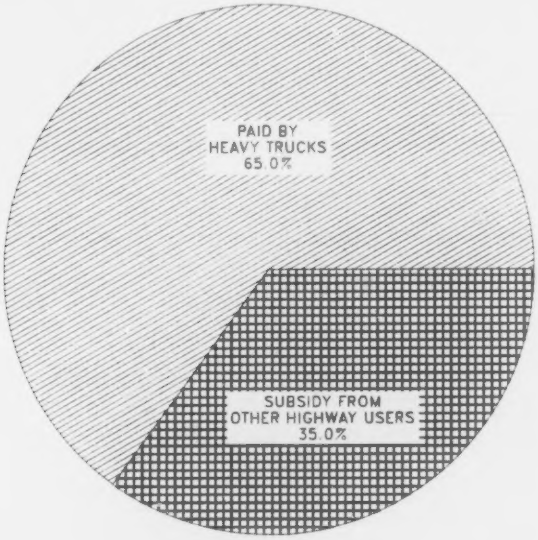
Excess Barge Capacity

Owing largely to the slump in export coal and grain movements, the barge industry has had significant overcapacity, and thus unusually low rates as competitors scramble for business. In 1985, for example, available evidence shows barge rates for chemical products were below their 1980 levels and coal rates declined between 25 and 40 percent.[37] Since barge equipment has a useful life of some 25 years, and most barges are less than 20 years old, there appears to be no early end to this overcapacity even if no new construction occurs.[38] The downward pressure on rates will persist.

The competitive pressure will last longer than economics might otherwise dictate because the waterway industry, too, enjoys a huge government subsidy. The barge industry annually pays about $45 million in user fees.[39] By comparison, the U.S. Army Corps of Engineers annually spends over $575 million on inland waterways.[40]

The barge industry annually generates about $2.5 billion in gross revenue.[41] Thus, the $530 million subsidy represents over 21 percent of the industry's gross revenue. In 1995, when the latest inland user fee is fully phased in, the barge industry will still be paying no more than 15 percent of Federal expenditures and receiving a subsidy of more than 24 percent of gross revenue.[42]

HEAVY TRUCKS PAY ONLY A PORTION OF THEIR TOTAL COST RESPONSIBILITY



III
RAILROAD RESPONSES

In the 1980's, the railroad industry has been vigorous in meeting the challenges confronting it. Both the work force and the physical plant have been trimmed to meet the needs of a rapidly changing transportation marketplace, and have been made more productive. A new group of entrepreneurial regional railroads has emerged to provide service tailored to the needs of customers located on low volume lines. Railroads and their suppliers have invested heavily in new technology and in research that will lead to substantially more efficient railroads in the 1990's. Deferred maintenance and car shortages have been eliminated, railroads have been made even safer, losses resulting from accidents and damage to freight have been sharply reduced, and service to shippers has been greatly improved. Freight rates have been reduced to meet the competition.

Finally, several railroads have initiated programs to become "total transportation companies" — transporters of goods from origin to destination by different modes. For years, Federal policies were biased against rail acquisitions of carriers in other modes, a vestige of the fear that railroad monopolies would acquire and strangle their weaker competitors. Fortunately, the economic efficiencies of intermodal integration and its benefits to the public are being recognized. Far from constituting a disinvestment from railroading, this development signals a continuing commitment by the railroads to better transportation service and a recognition of shippers' needs.

Labor Changes

Labor is the railroad industry's largest cost, consuming nearly 47 cents of every revenue dollar.[1] In 1985, the major railroad companies paid nearly $12.9 billion in wages, benefits and payroll taxes.[2] Railroad employees, on average, earned $46,000 (including fringe benefits) — or 45 percent more than the average manufacturing employee and 87 percent more than the average employee in domestic private industry.[3]

The large gap between rail wages and pay in other industries has widened in recent years. In fact, the wages and benefits paid to railroad employees increased 55 percent from 1980 to 1986 compared to a 33 percent increase in the consumer price index during the same period.[4] Faced with resistance to reducing wages and benefits or to making wholesale changes in work rules to gain productivity, the railroad industry responded by sharply reducing its workforce. Between 1980 and the end of 1986, employment on the major freight (Class I) railroads declined from 447,000 to 257,000, a decrease of 43 percent.[5]

Had these employment reductions not been made, the major freight railroads would have incurred almost $8 billion in additional labor expenses in 1986, a sum between six and seven times the railroads' net operating income in that year.[6] Clearly, absent this decrease in labor expense the railroad industry would have been awash in red ink.

The workforce reduction, coupled with those work rule improvements that could be collectively bargained, materially improved railroad labor productivity. From 1980 through 1986, freight revenue ton miles per employee increased from 2.1 million to 3.2 million, an improvement of 52 percent.[7] Freight revenue ton miles per employee hour increased similarly.

Reductions in Lines and Equipment

The profound changes in American industry brought about by global competition and rapid changes in the marketplace left the railroads with considerable surplus plant during the 1980's. Further, the existence of a large fleet of privately owned rail cars, bought largely as tax shelters, resulted in an excess number of cars. Railroad management responded by aggressively downsizing capacity.

Between 1980 and 1985, the major Class I freight railroads reduced their track ownership from 268,045 to 242,320 miles, a reduction of 9.6 percent.[8] During the same period, they reduced their locomotive fleet by 19 percent and their car fleet by 26 percent.[9] The retirement of surplus, older equipment and the installation of a modest amount of better performing new equipment raised the capacity of the average car by 7 percent and the horsepower of the average locomotive by 7 percent.[10]

The installation of larger specialized freight cars, combined with the retirement of small cars and a longer average haul, raised the average revenue ton miles per car loaded by 11 percent from 1980 to 1985.[11] Investment in fuel-saving technology and the retirement of older, less efficient locomotives raised revenue ton miles per gallon of fuel consumed more than 19 percent during the same period.[12]

The retirement of surplus equipment created a significant, one-time benefit to cash flow during the first half of the 1980's. Still, railroad capital investment during the 1980's has been substantial as useful plant was modernized and special equipment needs were met. In 1985, railroad capital expenditures reached $4.4 billion.[13] From 1980 through 1985, the major freight railroads acquired 3,450 new locomotives and 177,774 new freight cars, and put in 3.9 million tons of new rail and 140 million new crossties.[14] These expenditures helped bring to an end the problems of deferred maintenance that plagued shippers and railroads during the period of pervasive economic regulation.

Regional Railroads

In the past, light density lines were commonly subsidized by the railroads until they could be abandoned. In recent years, however, the industry has worked with entrepreneurial groups to create a new class of carriers known as regional railroads.[15] These entities, substantially larger than the traditional short line railroads, have preserved service on thousands of miles of low volume lines.

With wage rates and work rules appropriate to low volume operations, and local managers maintaining close contact with their customers, these new railroads provide more frequent and responsive service. They assist the major freight railroads, and their customers, by preserving for the railroad network traffic that otherwise would be lost, and they help railroad employees by preserving jobs that otherwise would be cut due to furloughs and abandonments. The regional railroads generally have hired employees who previously worked on the acquired lines, and in some cases have been able to increase both traffic and employment levels.

Research and New Technology

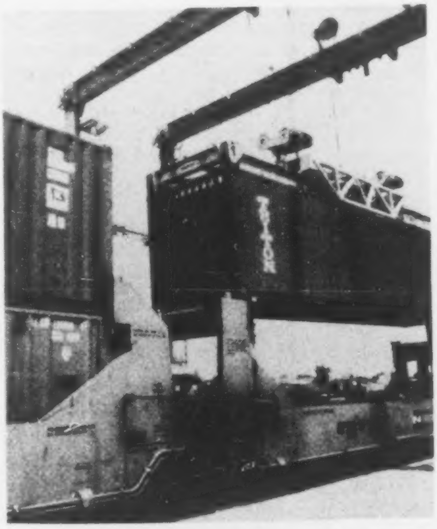
One of the most important elements of the railroad industry's response to changes in the transportation marketplace has been a marked increase in the rate of development and utilization of new technology.[16] In every area of railroading, technological change has contributed to increased productivity, service quality and safety.

The railroads have responded to truck competition by developing more efficient, cost-effective intermodal service — the piggyback movement of truck trailers and containers by rail, now the fastest growing segment of the railroad industry.[17] Tightly scheduled, service-oriented trains operating out of consolidated terminals which use advanced mechanization are being featured.[18]

Relying on computer technology and improvements in management information systems, these trains can take advantage of a variety of new equipment technologies, including double stack container cars, truck trailers such as Roadrailers and Railmasters that ride directly on rails, and energy-efficient skeletonized and articulated cars.[19] These developments reduce operating costs, allow railroads to compete for the rapidly increasing business moving in larger trucks and steamship containers, and in many cases reduce losses from damage to freight.[20]

New technology has brought improved service to shippers of bulk commodities as well. Higher capacity aluminum cars — often with aerodynamically efficient features — are increasingly common.[21] Manufacturers have developed locomotives with more horsepower and improved adhesion.[22] Railroads and their suppliers also are working to reduce fuel costs by increasing locomotive efficiency, installing new systems that lubricate the rails to reduce fuel consumption, and investigating use of lower cost types of diesel fuel.[23]

The cost of maintaining railroad infrastructure is being reduced by the use of better ballast, of new higher strength steel rails that endure longer, and of longer lasting concrete ties.[24] Computer-controlled track maintenance equipment, such as rail laying machines and automated tampers, that perform maintenance more quickly and efficiently have been developed and installed to meet the needs of high-density rail operations.[25]



Double-stack trains mean fewer flat cars and reduced overall train weight, translating into higher speeds and less fuel consumption.

Finally, railroads have developed substantially improved train dispatching systems using sophisticated computers to increase the density of traffic that can be handled safely and efficiently over a single route.[26]

The industry is in a position to pursue these research opportunities in great measure because of improvements in the facilities available for the conduct of research. Of special noteworthiness is the Transportation Test Center in Pueblo, Colorado, the most modern rail testing facility in the world. The Center was taken over by the industry from the Federal Railroad Administration in aid of the Administration's privatization goals.[27]

Further improvements are possible in the near future with additional research and development by railroads and railroad suppliers. Integral trains that employ technology to reduce the costs of unit train service for both bulk and merchandise traffic are being developed by suppliers participating in the industry's High Productivity Integral Train Project, a program designed to reduce train operating costs significantly.[28] Over the long term, line-haul cost reductions of up to 22 percent in bulk commodity service and 45 percent in intermodal service appear within reach by the application of new technology.[29]

In addition, third-generation information systems, which add decision assistance capability to the data retrieval and processing elements of earlier systems, offer great potential for such essential railroad functions as dispatching. Advanced train control systems placed on locomotives, which communicate with transponders or satellites to provide precise speed and location information and direct communication with dispatchers, promise to revolutionize the planning and control of railroad operations.[30]

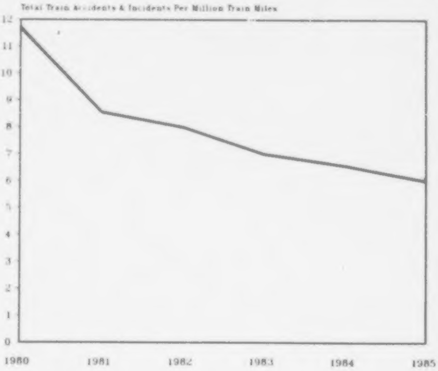
Improved Safety

The railroad industry's investment in track and equipment, together with better safety training, has paid substantial benefits in improved safety and reduced losses from accidents and damage to freight. From 1980 through 1985, the number of railroad accidents declined 59 percent.[31] This translated into a decline in the number of accidents per million train-miles of 49 percent.

Since 1980, train accidents related to bad track declined 63 percent, further evidence that the industry's cash flows have enabled it to catch up on deferred maintenance. Deaths from train accidents have declined 46 percent since 1980, and personal injuries were down by 25 percent.[32]

Railroads have always been an extremely safe mode of transportation, and the improvements since 1980 are especially important when viewed in the context of the hazardous materials railroads are called upon to transport. Since 1980, accidents involving hazardous materials have been reduced 49 percent, accidents involving release of hazardous materials have declined 55 percent and accidents forcing evacuations have dropped 35 percent.[33]

RAILROAD ACCIDENTS HAVE DECREASED SIGNIFICANTLY



The improved railroad safety record benefits shippers as well as the public. Railroads can now operate at higher speeds, provide quality service and do less damage to lading. From 1980 to 1985, railroad costs for damage from accidents declined 47 percent in constant dollars.[34]

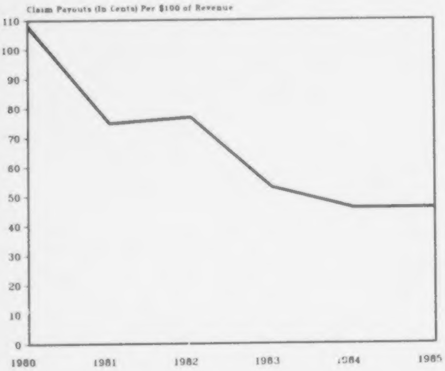
During the same period, freight loss and damage payments to shippers declined 53 percent, from $324 million to $151 million. As a percentage of gross freight revenue, loss and damage payments decreased by 57 percent. To put the improvement in context, from 1975, when the industry was totally regulated, to 1985, loss and damage payments per $100 of revenue declined from $1.83 to 46 cents — a 75 percent reduction.[35]

Improved Service

Given the marketing and management tools to do the job, railroad managers have worked hard to improve the service they offer to shippers.

As noted earlier, the railroads have been able to reduce the equipment fleet significantly.[36] A large part of this reduction has been made possible by improved management in a less regulated environment. For example, the deregulation of intermodal traffic greatly intensified competition and led railroads to make major changes in the way they did business.[37] As a result of these efforts, the industry's largest supplier of intermodal flatcars, Trailer Train Company, increased its average miles per car per day from a high of 172 in the four years preceding deregulation, to 216 by 1984.[38]

RAILROAD LOSS AND DAMAGE
COSTS HAVE DECLINED



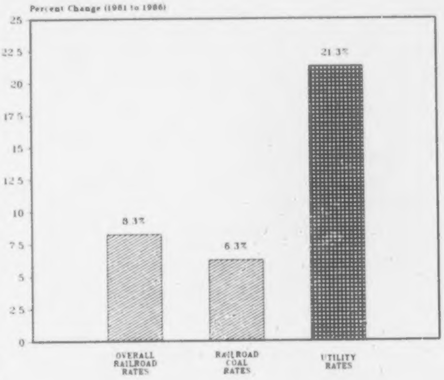
This marked improvement in the utilization of intermodal flatcars springs directly from the marketing and management freedoms of deregulation. And the shift from boxcar to the faster intermodal movements represents a significant service improvement for shippers.

All of this — improved safety, better freight loss and damage control, availability of cars, and faster track — has led to more satisfied shippers. A November 1986 nationwide survey of railroad shippers found that nearly three-quarters of them believe that the railroad industry has continued to improve.[39]

Rate Levels

Railroad initiatives in the rate area have also conferred substantial benefits to shippers and, accordingly, to the public. The rate of annual increases in railroad freight rates during the five-year period after the Staggers Act was only about one-third the rate of increase in the five years preceding the law.[40] And railroad freight rates have actually declined in constant dollars since 1981.[41]

RAILROAD AND UTILITY RATE TRENDS



By way of comparison, increases in railroad freight rates in general, and coal rates in particular, were far less than the increases in electric utility rates during the post-Staggers period.[42] From 1981 through 1986 railroad rates generally increased 8.3 percent, railroad coal rates increased 6.3 percent, and electric rates increased 21.3 percent.[43]

In constant dollar terms, from 1981 to 1986, railroad freight rates as a whole declined by about 5.1 percent and railroad coal rates decreased by about 6.9 percent.[44] From 1980 to 1986, railroad grain rates dropped by approximately 44 percent.[45] In essence, in every year since 1981, railroads charged less on average in constant dollars for each ton-mile of freight carried and, since 1982, charged less in current dollars.[46]

Indeed, the rail industry has taken measures necessary to remain competitive and to adapt to the constantly changing environment described in Section II. The next Section will outline the challenge ahead if railroads are to remain a viable, private sector component of the nation's economy.

IV
THE CHALLENGE

The rail industry closed the books on 1986 with tough work before it. Downward trends in tonnage and profits, and increasing competitive pressures — including substantial competition between the railroads themselves — are unabated. The new tax structure shows every promise of impairing future cash flows, particularly in years of depressed earnings. Survival is clearly hinged on productivity gains of major proportions, but numerous hurdles lie in the way. Finally, developments in the legislative arena could wipe out many of the improvements attainable by private initiative.

Even if government does not change the balance adversely, the challenge for the industry is enormous. The future cannot be quantified with reasonable precision because there are too many important unresolved variables — the outcome of labor negotiations, potential Federal legislation improving truck efficiency and increasing subsidies to that sector, the imposition of new constraints on rail management flexibility by re-regulation, to name only a few. However, it is possible to assess what the future will hold if present long-term trends continue and if the railroads are handicapped in their ability to adapt to these trends.

For example, if no dramatic events, positive or negative, occur beyond the trends observed through 1986, rail tonnage will remain flat and competition will force continued rate compression. To maintain adequate levels of capital investment, substantial reductions in rail costs will be mandatory since there is no realistic source of relief on the revenue side.

Certainly, preserving the gains of the Staggers Act will not be enough; vigorous self-help measures will have to be put in place across the board. While there are obvious differences among the individual companies that comprise the industry, none is impervious to the pressures described in this paper.

Certain variables, within the control of Government, could have ruinous consequences. As stated earlier, for example, the "Pinwheel" amendment, if enacted on a nationwide basis, would slash 65 percent of the industry's current pre-tax net operating earnings and advance the time when a serious threat of cash erosion would exist.[1]

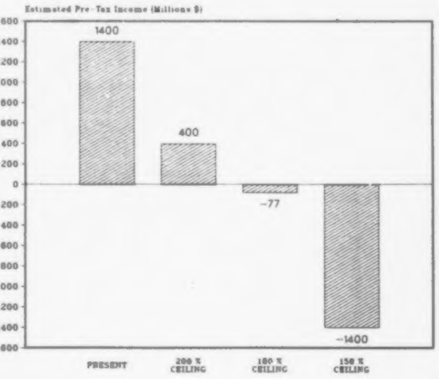
Another quantifiable issue is that involving maximum limits on railroad rates. Under the Staggers Act, the railroads are free to price rail transportation to a level where revenues are at least 180 per cent of variable costs.[2] Above that level, the railroad may be found to have "market dominance" over the shipper and the rate becomes subject to the maximum rate jurisdiction of the Interstate Commerce Commission.[3]

In recognition of commercial realities, railroads, like many other businesses, engage in "differential" or "demand-based" pricing, a freedom enhanced by the Staggers Act.[4] For example, lower rates are charged for traffic most easily diverted to trucks. If all traffic had to be carried at the same revenue/cost ratio, truck-competitive traffic would desert the rails; in that event, traffic less sensitive to competition would have to bear all the brunt of fixed rail costs.

Several proposals to eliminate differential pricing were advanced during the 99th Congress and will certainly be taken up again.[5] The stakes are enormous. In 1985, the industry's rail operations before taxes and after fixed charges generated income of $1.4 billion. If an absolute ceiling of 200 percent of revenue to variable cost had been imposed on rail rates, the railroads' pre-tax income would have dropped to $400 million, a decrease of $1 billion. At 180 percent, the industry would have been in the red by $77 million.

In 1985, an average rate of 150 percent would have been necessary to earn the industry's cost of capital. If, as some advocated, the cap for all rates had been lowered to the 150 percent level, the industry would have lost revenues of $2.9 billion and would have suffered a deficit of $1.4 billion.[6]

ENACTMENT OF MAXIMUM REVENUE/VARIABLE COST CEILINGS COULD SIGNIFICANTLY REDUCE THE RAILROAD INDUSTRY'S PROFITS



Importantly, these lost revenues would have represented real cash drains: a lowering of the cap depresses earnings but results in no savings in expenses because the same traffic would be moved, but at lower rates. The conclusion is irrefutable that legislating artificial caps on rail rates would be ruinous for the railroad industry.

Another unknown of potentially devastating impact is the Railroad Retirement Fund. Railroad employees are covered by a separate, Federally controlled retirement system that costs employers almost 180 percent more than Social Security, and employees 52 percent more.[7] While major changes were enacted by Congress in 1983 to shore up the solvency of the Fund, sharp declines in employment have affected the actuarial assumptions and the long-term integrity of the Fund is again in question.[8]

Several proposals have already been advanced to deal with the Retirement Fund. One would encompass a privatization of that part of the Fund which confers benefits in addition to those equivalent to the Social Security system. If espoused on a fully funded basis, that solution would involve annual cost increases of over $1.5 billion.[9] If the burden of this cost were thrust in any major way upon the industry, no scenario for the future permits it to continue operating and absorb the burden. Simply stated, only in liquidation could this new debt be met.

Other medium-term proposals are less draconian but are most troubling. For example, it has been suggested that a $300 million yearly increase in revenues will be needed to maintain the Fund on a sound basis through the next 25 years.[10] Whatever portion of this cost is eventually assessed against the industry offsets desperately needed cost reductions or productivity gains.

If new burdens are imposed on the rail industry or if the hands of time are set back on regulation, the industry cannot remain as presently constituted. The pattern of the 1960's and 1970's — self-defeating rate increases engendering massive traffic diversions and deferred maintenance — would hopefully not be repeated. As a practical matter, rate increases on all but the most captive traffic is simply not feasible in view of the competitive situation. Access to the capital markets would be sharply curtailed, as it was in prior decades.

One option in the face of declining earnings would clearly be to accelerate the abandonment process. Even at present, railroads must prune existing plant in the face of no traffic growth, high capital replacement costs, the need to lower costs, and the expansion of piggy-back service featuring heavy volume terminals fed by truck pick-up and delivery service in outlying areas. Assuming all other areas of self-help have already been fully tapped, the industry would have no recourse but to retrench to very high-density core systems.

At present, the total railroad industry operates approximately 161,000 miles of road, down 23 percent from the 209,000 mile network of 1970.[11] A further elimination of 30,000 miles, about 19 percent of the network, could be accomplished with a loss of less than 4 percent in carloadings.[12] A 28 percent cutback, or 45,000 miles, would jeopardize less than 9 percent in carloadings.[13]

Such results seem draconian, but appear to be the only alternative to the unfortunate bankruptcies of the 1970's. If, as some propose, abandonment procedures are made more cumbersome, even that alternative wanes.[14]

The fact is that the railroad industry is in need, not of restrictive measures, but of constructive Federal involvement. As noted earlier, truck and barge operators are the beneficiaries of huge Government subsidies. The present inadequate level of user charges defies logic and fairness. Further, a major overhaul of laws governing labor-management relations is overdue. Unlike other industries, railroads are still subject to secondary picketing, a Federal policy permitting a local dispute to disrupt the entire economy.[15]

The present system of compensating employees for on-the-job injuries, the Federal Employers' Liability Act (FELA), is unfair both to the worker and to employer.[16] Contrasted to modern workmen's compensation programs, the costs of operating under FELA are enormous. By placing the issue in the context of a lawsuit, injured workers must incur substantial legal fees as deductions from their claims, and the case is placed in an unnecessarily adversarial posture.[17]

The above are offered as a few examples of need to review, in a positive fashion, the relationship between the railroad industry and the Federal Government. Federal policies should be aimed at putting railroads on a par with other businesses, and not at widening the gap between the realities of the market place and the law. Costly anachronisms must be changed. If they are, the industry can serve the public interest well and do so as a healthy private enterprise.

APPENDIX

FOOTNOTES

Various footnote references are to source materials compiled by the Association of American Railroads (AAR), such as *The Coal Book*, *The Grain Book*, etc. For further elaboration on individual references, please contact Mr. David F. Miller, Director, Finance & Statistics, Association of American Railroads, Room 5404, 50 F St. N.W., Washington, D.C. 20001.

INTRODUCTION

[1] *See* Interstate Commerce Act, ch. 104, 24 Stat. 379 (1887) (codified as amended in scattered sections of 49 U.S.C.).

[2] *See, e.g.*, Safety Appliance Act, ch. 196, 27 Stat. 531 (1893) (codified at 45 U.S.C. §§ 1-7 (1982)); Air Brakes Act, ch. 976, 32 Stat. 943 (1903) (codified as amended at 45 U.S.C. §§ 8-10 (1982)); Block Signal Resolution, No. 46, 34 Stat. 838 (1906) (codified as amended at 45 U.S.C. § 35 (1982)); Hours of Service Act, ch. 2939, 34 Stat. 1415 (1907) (codified as amended at 45 U.S.C. §§ 61-66 (1982)); Federal Employers' Liability Act, ch. 149, 35 Stat. 65 (1908) (codified as amended at 45 U.S.C. §§ 51-60 (1982)); Ash Pan Act, ch. 225, 35 Stat. 476 (1908) (repealed 1983); Boiler Inspection Act, ch. 103, 36 Stat. 913 (1911) (codified at 45 U.S.C. §§ 22-34 (1982)); Railway Labor Act, ch. 347, 44 Stat. 577 (1926) (codified as amended at 45 U.S.C. §§ 151-88 (1982)).

[3] Federal Aid Highway Act, ch. 582, 49 Stat. 1519 (1936) (codified as amended in scattered sections of 23 U.S.C.); Inland Waterways Transportation Act, ch. 91, § 500, 41 Stat. 456, 499(1920) (codified as amended at 49 U.S.C. § 142 (1982)).

[4] *See* AAR, *Railroad Mileage by States, December 31, 1971*, at 2-60 (1972). The bankrupt roads included Ann Arbor; Boston & Maine; Central Railroad of New Jersey; Erie Lackawanna; Lehigh Valley; Chicago, Milwaukee, St. Paul & Pacific; Penn Central; Reading; Chicago, Rock Island & Pacific. *Id.*

[5] See U.S. Dep't of Transportation, *A Prospectus for Change in the Freight Railroad Industry* 69-70 (1978), which stated:

> "With some exceptions . . . railroad earnings are too low to attract new equity or debt other than for equipment purchases or rollover of old debt . . . Investor reluctance exists because the industry's average cost of capital exceeds the return on investments made with the capital. As a result, the availability of private capital for future investments may be curtailed, because investors believe that returns generated with the investment of additional capital will not equal returns from alternative investments of similar risks."

See also, America's Sound Transportation Review Organization, *The American Railroad Industry: A Prospectus* 4-10 (1970).

[6] *See*, e.g., Regional Rail Reorganization Act of 1973, Pub. L. No. 93-236, 87 Stat. 985 (codified as amended in scattered sections of 45 and 49 U.S.C.); Railroad Revitalization and Regulatory Reform Act of 1976, Pub. L. No. 94-210, 90 Stat. 31 (codified as amended in scattered sections of 15, 31, 45 and 49 U.S.C.); Milwaukee Railroad Restructuring Act, Pub. L. No. 96-101, 93 Stat. 736 (1979) (codified as amended in scattered sections of 45 U.S.C.); Rock Island Railroad Transition and Employee Assistance Act, Pub. L. No. 96-254, 94 Stat. 399 (1980) (codified as amended in scattered sections of 45 U.S.C.).

[7] Pub. L. No. 96-448, 94 Stat. 1895 (codified as amended in scattered sections of 11, 45 and 49 U.S.C.).

[8] Pub. L. No. 97-35, 95 Stat. 643 (codified as amended in scattered sections of 45 U.S.C.).

[9] *See 126* Cong. Rec. 24,823 (1980) (statement of Rep. Staggers); 126 Cong. Rec. at 24,827 (statement of Rep. Lee).

[10] Pub. L. No. 97-34, 95 Stat. 172 (codified as amended in scattered sections of 26, 42, 45 and 46 U.S.C.). *See generally* S. Rep. No. 144, 97th Cong., 1st Sess. 12-13 (1981), *reprinted in* 1981 U.S. Code Cong. & Admin. News 105, 119-20.

[11] *See Staggers Act Oversight Hearings Before the Subcomm. on Surface Transportation of the Senate Comm. on Commerce, Science and Transportation*, 99th Cong. 1st Sess. (Nov. 1, 1985) (statement of John Riley, Administrator, Federal Railroad Administration); *see also* Shedd, *Productivity: The Key is Employee Development*, Modern Railroads, Feb. 1987, at 15-18.

[12] *See* Railroad Anti-Monopoly Act of 1985, S. 447, 99th Cong., 1st Sess., 131 Cong. Rec. S1342-43 (daily ed. Feb. 7, 1985), H.R. 1140, 99th Cong., 1st Sess. (1985); Consumer Rail Equity Act, S. 477, 99th Cong. 1st Sess., 131 Cong. Rec. S1581-83 (daily ed. Feb. 20, 1985), H.R. 4096, 99th Cong., 2d Sess. (1986).

[13] *See* 132 Cong. Rec. H11,449 (daily ed. Oct. 17, 1986).

[14] *See, e.g.*, Clayton Act Amendments of 1987, H.R. 941, 100th Cong., 1st Sess. (1987), S. 443, 100th Cong., 1st Sess., 133 Cong. Rec. S1614 (daily ed. Feb. 3, 1987); Consumer Rail Equity Act, H.R. 1393, 100th Cong., 1st Sess. (1987), S. 676, 100th Cong., 1st Sess., 133 Cong. Rec. S2839-41 (daily ed. Mar. 6, 1987), *see also* 132 Cong. Rec. H11,449 (daily Ed. Oct. 17, 1986) (statement of Rep. Dingell that legislation imposing labor protection conditions on line sales will be taken up again in 1987).

I: THE INDUSTRY TODAY

[1] Transportation Policy Associates, *Transportation in America* 6 (4th ed. 1986 and Supp. Nov. 1986).

[2] The steel shipment statistic is taken from Data Resources, Inc., *Transportation Review* 49 (Summer 1986). The motor vehicle statistic is based on Feb. 26, 1987 telephone interview with the *Statistics Section* of the Motor Vehicles Manufacturers' Association, Washington, D.C.

[3] AAR, *The Coal Book* 18, 22, 24 [hereinafter *Coal*]. *The Coal Book* is a compilation of a variety of statistics designed to show the scope of the coal market, and the relationship between coal and the railroad industry.

Most of the material was derived from either governmental sources, the National Coal Association or the AAR. *See also* AAR, *Railroad Facts* 28 (1986) [hereinafter *Facts*].

[4] AAR and Federal Railroad Administration, U.S. Dep't of Transportation, *1985 Carload Waybill Sample Overview Report TD-1* at 23 (Apr. 1987) and report prepared for the Joint Economic Committee by the Council of Economic Advisors, *Economic Indicators* at 23 (Mar. 1987).

[5] Section 208(a), 94 Stat. at 1908 (codified as amended at 49 U.S.C.A. § 10713 (1987)).

[6] This statistic was derived from a periodic survey of railroad sources taken by the AAR of traffic moving under confidential railroad rates [hereinafter *Periodic Survey*].

[7] AAR, *The Grain Book* 8, 14 (1986) [hereinafter *Grain*]. *The Grain Book*, published by the AAR annually since 1981, is a compendium of statistics on grain production, rail grain traffic, the makeup of the railroad grain car fleet, and grain exports. It contains an introduction summarizing highlights of the most current data on grain and the railroads.

Principal sources for this publication are the AAR, the U.S. Dep't of Agriculture and the American Railway Car Institute.

[8] *Id.* at 25.

[9] 3 AAR, *Railroad Grain Rates in The Competitive Marketplace* (1987).

[10] *Periodic Survey, supra* note 6, I.

[11] AAR, *Railroad Ten Year Trends*, Table II-C-1, Table II-C-9, Table II-A-[illegible] (1986) [hereinafter *Trends*].

[12] The 1986 freight railroad industry employment figure is comprised of the following:

TYPE OF RAILROAD	NUMBER OF EMPLOYEES
Class I Line-Haul Railroads	257,263
Regional	6,713
Local	7,497
Switching & Terminal	2,404
Total	273,877

Bureau of Accounts, Interstate Commerce Commission (ICC), *Report of Railroad Employment - Class I Line-Haul Railroads, Statement No. M-350* (Dec. 1986) [hereinafter *Statement No. M-350*]. The figure shown for the Class I railroads is the mid-month count for December 1986; the average for 1986 was approximately 274,200.

The figures for Regional, Local, and Switching & Terminal employment were developed by AAR through communication (written and oral) with over 470 individual railroads.

[13] AAR, *Analysis of Class I Railroads* 19, Lines 78-80, 84 and 97 (1986) [hereinafter *Analysis*], is a series published annually by the AAR since 1978, which summarizes the Class I railroad operating and financial statistics based on reports filed with the Interstate Commerce Commission.

[14] *See, e.g.*, section 402, 94 Stat. at 1941 (codified as amended at U.S.C. §§ 10903-05 (1982 & Supp. II 1984)) (abandonments); section 208(c), 94 Stat. at 1908 (codified as amended at 49 U.S.C.A. § 10713 (1987)) (contracts); section 201(c), 94 Stat. at 1898 (codified at 49 U.S.C. § 10701a (1982)) (rate standards); section 203(c), 94 Stat. at 1901 (codified at 49 U.S.C. § 10707a (1982)) (zone of rate flexibility).

[15] *Trends, supra* note 11, I, at Table II-C-9; Williams, *Tax Changes Give Railroads A Big Break*, Wall St. J., Oct. 27, 1981, at 12, Col. 1. *See also supra* note 10, INTRO and accompanying text.

[16] The 31 percent decline in Net Railway Operating Income (NROI) was based on the following financial information:

Year	NROI* (millions) (1)	GNP Implicit Price Deflator (1980 = 100) (2)	Real NROI (mill.) (3)
1980	$1,339	100.0	$1,339
1981	1,361	109.7	1,241
1982	742	116.7	636
1983	1,278	121.2	1,054
1984	1,680	125.9	1,334
1985	1,305†	130.1	1,003
1986‡	1,226†	133.6	918

Percent Decline - 1980-1986: *31.44%*

*Net Railway Operating Income (NROI) is the only measure of railroad income reported under the same accounting system over the past six years. See footnote in text.

†Reported NROI adjusted for the estimated effect of special charges of $465 million in 1985 and $632 million in 1986. Inclusion of such charges would have materially reduced NROI even further in those two years.

‡Year 1986 estimated.

Sources: Column (1) for years 1980-1982, *Analysis, supra* note 13, I, at 1, line 5; 1983 and 1984 Supplemental Report to ICC of NROI prepared on a betterment accounting basis; year 1985, *Analysis, supra* note 13, I, at 25, line 110; year 1986 estimated using Fourth Quarter Revenues, Expenses and Income (Form RE&I) reports submitted by Class I Railroads to the ICC.

Column (2) report prepared for the Joint Economic Committee by the Council of Economic Advisors, *Economic Indicators*, at 2 (Mar. 1987).

Column (3) is calculated.

[15] The calculation of the 28 percent decline in NROI based on depreciation accounting is set forth below:

Year	NROI (millions)
1984	$2,537.0
1985	2,185.0
1986	1,828.0(est.)

Percent Decline - 1984-1986: 27.9%

The 1984 and 1985 NROI data are taken from *Analysis, supra* note 13, I, at 1, line 5; 1986 NROI was estimated by AAR. All figures have been adjusted to exclude special charges.

[16] For years 1981 and 1982, see AAR, *Facts, supra* note 3, I, at 18; for years 1983-1986, *see infra* note 19, I.

[17] The ROI figures shown in the Table, "Return on Investment vs. Cost of Capital", were computed using NROI figures based on betterment accounting. *See supra* note 16, I. The average investment base 1980-1985 taken from the following sources: *Analysis, supra* note 13, I, at 25, Line 113 (1980-83), Line 103 (1985); year 1984 was calculated from R-1 Supplemental Reports to the ICC submitted by Class I Railroads; and 1986 investment base was estimated by AAR. Cost of Capital figures 1980-1985 based on ICC's determination of the Railroad Industry Cost of Capital as decided in Ex Parte No. 415, *Railroad Cost of Capital-1981*, 365 I.C.C. 734 (1982); Ex Parte No. 436, *Railroad Cost of Capital-1982*, 367 I.C.C. 662 (1983); Ex Parte No. 452, *Railroad Cost of Capital-1983*, 1 I.C.C. 2d 643 (1984); Ex Parte No. 458, *Railroad Cost of Capital-1984*, 1 I.C.C. 2d 989 (1985); and Ex Parte No. 464, *Railroad Cost of Capital-1985*, served Mar. 16, 1987.

[18] Return on equity statistics for (a) Electric Utilities, all years, taken from *Moody's Public Utility Manual* a13 (1986);

(b) All industry:

Year 1981-*Who Did Best and Worst Among the 500*, Fortune, May 3, 1982, at 281;

Years 1982 and 1983-*Who Did Best and Worst Among the 500*, Fortune, Apr. 30, 1984, at 296;

Years 1984 and 1985-*Who Did Best and Worst Among the 500*, Fortune, Apr. 28, 1986, at 202;

Year 1986-*Who Did Best and Worst Among the 500*), Fortune, Apr. 27, 1987, at 385;

(c) Railroads, 1981-1985, taken from *Facts, supra* note 3, I, at 21; 1986, AAR estimate.

[19] The Fortune 500 Industrial ROE's are from *The Industry Medians*, Fortune, Apr. 28, 1986, at 202. The Railroad ROE's are from Fortune, June 9, 1986, at 138-39. Railroads included in Fortune's ROE calculations were Burlington Northern; CSX; Santa Fe Southern Pacific; Norfolk Southern; Illinois Central Gulf; Chicago & North Western; Soo Line; Kansas City Southern Industries; Grand Trunk Western.

[20] Data set forth in Table *Percent Changes in Stock Indices* were based on the following:

	Year End Indices 1980	Year End Indices 1986	Percent Changeover 1980
S&P Indices:			
Rail	107.0	136.1	27
500	135.8	242.2	78
Transp.	126.2	197.3	56
Elec. Util.	27.2	58.3	.114

The 1980 S&P Indices are from Standard & Poor's Statistical Service, *Security Price Index Record* 4, 6, 91, 97 (1986). The 1986 S&P Indices are from Standard & Poor's Statistical Service, *Current Statistics*, 33, 34, 37, 40 (Mar. 1987)

	Year End Indices 1980	Year End Indices 1986	Percent Changeover 1980
Dow Jones Indices:			
Industrials	964.0	1,895.0	97
Transp.	398.1	807.2	103
Utilities	114.4	206.0	80

The 1980 Dow Jones Indices are from Wall St. J., Jan. 2, 1981, at 31. The 1986 Dow Jones indices are from Wall St. J., Jan. 2, 1987, at 28.

[21] *Facts, supra* note 3, I, at 18.

[22] *Trends, supra* note 11, I, at Table II-C-9.

[23] *See* Wall St. J., *supra* note 15, I; Merrill Lynch, *Railroad Industry, Quarterly Update and Review* 34, 35 (Nov. 1986).

[24] The frozen base eligible for depreciation under ERTA was approximately $8 billion. This information was obtained pursuant to the ICC's *Reporting Bulletin No. 83-2* (Feb. 28, 1983). Assuming maximum depreciation over a five-year period at the highest marginal corporate tax rate of 46 percent, the cash flow benefit would have been as much as $3.6 billion. The AAR has estimated $2.5 billion, a lower figure, based on the fact that not all railroads would have utilized the maximum write-off. Tax returns for individual companies are not available.

[25] *Industry-by-Industry Reviews of Tax Bill Shows Loss of Special Deductions Offsets Rate Cut*, Wall St. J., Aug. 19, 1986 at 6, Cols. 1-6; *What Tax Reform Will Mean For Profits - And For Stocks*, Fortune, Sept. 1, 1986, at 90.

II: TRAFFIC LEVELS AND COMPETITIVE PRESSURES

[1] *Trends, supra* note 11, I, at Table III-C-1, Table III-C-8. Data for 1986 taken from A.A.R. *Freight Commodity Statistics* (U.S. Class I Railroads), Table A3, at 28, 39 (1986).

[2] *Transportation in America, supra* note 1, I, at 4.

[3] *Id.*

[4] Council of Economic Advisors, *The Annual Report of the Council of Economic Advisors (Economic Report of the President)*, Table B-6, at 252 (1987).

[5] Brown, *One for the Road*, Wash. Post, Nov. 24, 1985, at G4, Cols. 1-2.

[6] National Highway Traffic Safety Admin., U.S. Dep't of Transportation, *Automotive Fuel Economy Programs, Sixth Annual Report to the Congress*, Table II-3, at 11 (Jan. 1982) (1978 data) and Tenth Annual Report to the Congress, Table II-3, at 10 (Jan. 1986) (1985 data).

[7] Hogan, *Steel Industry Future*, Skilling Mining Rev., Nov. 8, 1986, at 4-8.

[8] *Coal, supra* note 3, I, at 10. *See also*, U.S. Dep't of Energy, *Energy Security (A Report to the President of the United States)* 171 (1987).

[9] *Grain, supra* note 7, I, at 34.

[10] *Id.*

[11] Congressional Budget Office, Congress of the United States, *Has Trade Protection Revitalized Domestic Industries* 54 (1986). *See also* American Iron Steel Institute, *Annual Statistical Report*, Table 1A, at 8 (1985).

[12] *See generally, Deregulation and the Motor Carrier Industry*, Review of the U.S. Economy, Mar. 1987, at 24-29 [hereinafter *Deregulation*].

[13] *See* Bowersox, Closs & Helferich, *Logistical Management* 23-25, 67, 282-283 (3d ed. 1986). *See generally* Delaney, *The Disunited States: A Country in Search of An Efficient Transportation Policy*, CATO Institute Policy Analysis (Mar. 10, 1987).

[14] Pub. L. No. 96-296, 94 Stat. 793 (codified as amended in scattered sections of 18 and 49 U.S.C.). *See* H.R. Rep. No. 1069, 96th Cong., 2d Sess. 3, *reprinted in* 1980 U.S. Code Cong. & Admin. News 2284, 2285 (legislative solution aimed at increasing competition).

[15] Intermodal Policy Division (IPD), AAR, *Innovation in Trucking: Advanced Truckload Firms* (Jan. 15, 1987) (unpublished manuscript presented by L. Lane at the Transportation Research Board Annual Meeting). The term "Advanced Truckload Firms, " or ATLFs, is for the most advanced current intercity Truckload (TL) carriers. The best description of their cost structure and operation is included in individual firm prospectuses. *See generally J.B. Hunt, Prospectus* (Feb. 14, 1985); *MNX Inc., Prospectus* (July 25, 1986); *P.A.M. Transportation Services, Inc., Prospectus* (Sept. 10, 1986); *Werner Enterprises, Inc., Prospectus* (June 20, 1986). *See also* Robinson-Humphrey Company, Inc., *P.A.M. Transportation Service, Inc.* 2, 5-7, 10 (1987) [hereinafter *P.A.M. Transportation*] (refers to ATLF's as High Service Truckload, or HSTL, carriers).

[16] The truck cost estimate is the product of an econometric analysis using the IPD, AAR Intermodal Competition Model (*ICM*) [hereinafter *ICM*]. The *ICM* is also used to predict rail revenue losses and traffic diversion. The *ICM* estimates the impact on rail revenue and traffic resulting from changes in heavy truck costs. The model includes three cost programs and a separate report program. The cost models are a rail cost model, a truck cost model and a shipper cost model.

The model is based on the concept of "total logistics cost, " defined as the sum of transport costs and "non-transport logistics" or "shipper" costs. Since non-transport logistics costs can vary significantly among modes and commodities, the mode with the lowest freight rate does not necessarily have the lowest total logistics costs. The *ICM* determines total logistics costs by using the shipper cost model in tandem with the truck and rail cost models. Truck costs are computed using information developed from the National Motor Transport Data Base [hereinafter *NMTDB*], which is a nationwide sample of trucking conducted by Transportation Research and Marketing (TRAM) of Challis, Idaho, since 1977.

The *ICM* compares rail and truck total logistics costs for each movement, assigns the movement to the low cost mode and adjusts rail revenue to account for any competitive rate adjustments.

a. If rail total logistics cost is more than truck total logistics cost, the model lowers the rail rate to equalize costs from both modes. Rail revenues will therefore decrease.

b. If the rail rate falls below the variable cost of the move, including shipper cost, the model diverts the shipment to truck. The railroad loses all the revenue associated with the shipment, but also avoids the variable cost of the move.

The principal model data base is the ICC rail waybill sample. Rail cost inputs are from Rail Form A, an accounting-based rail cost system used by the ICC. Truck cost inputs come from a broad array of sources, including trucking industry equipment suppliers, trucking company prospectuses, industry publications and discussions with industry sources.

[17] ATLF truck cost estimate is based on *ICM* analysis. See *supra* note 15, II for ATLF description. See *supra* note 16, II for a description of the *ICM*.

[18] Per ton-mile costs are based on an average *NMTDB* loading of 19 tons. *See NMTDB, supra* note 16, II.

[19] *See P.A.M. Transportation, supra* note 15, II, at 5; *see also Deregulation, supra* note 12, II, at 28.

[20] *P.A.M. Transportation, supra* note 15, II, at 5-6. The average annual compensation for an ATLF employee of $34,485, reflects per mile rates of $0.25 for P.A.M. Transportation multiplied by its average annual tractor mileage for 1986 of 137,940. The cited figure includes benefits. This estimate may be too high, however. *NMTDB* data for 1986 indicate average annual compensation of $26,227 for typical rail competitive truckers. *See NMTDB, supra* note 16, II. ATLF compensation would be slightly higher.

[21] The cited figure of $46,000 includes benefits. It is based upon average annual wages for rail labor (1985) of $34,991. See *Facts, supra* 3, I, at 57. Average annual fringe benefits for rail labor (1985) are 30.9% of base wages, or $10,812. *See Analysis, supra* note 13, I, at 55, lines 250, 251.

[22] NMTDB, supra note 16, II.

[23] Energy Information Admin., U.S. Dep't of Energy, *Monthly Energy Review*, Sept. 1986, at 99.

[24] Truck cost data derived from *ICM*. *See supra* note 16, II. For rail cost data, *see Analysis, supra* 13, I, at 186.

[25] Interview with Jim Palmer, President, Jim Palmer Trucking, in Missoula, Mt. (Feb. 12, 1987). *See also J.B. Hunt, Prospectus* 13 (Feb. 14, 1985).

[26] Estimate derived by AAR analysis using a time series regression of 1980 to 1985 annual mileage data from *NMTDB*. *See NMTDB, supra* note 16, II.

[27] *Id.*

[28] Estimate derived by AAR analysis using a time series regression of J.B. Hunt Transport's annual tractor mileage from 1980 to 1985. Hunt's tractor mileage data for analysis obtained from Securities Research Div., Merrill Lynch Capital Markets, Merrill Lynch, Pierce, Fenner and Smith, Inc., *Specialty Truckers*, July 19, 1985, Table 5, at 20.

[29] S. 2240, 99th Cong., 2d Sess., 132 Cong. Rec. S3519-23 (daily ed. Mar. 26, 1986).

[30] The amount by which railroads would have to lower their rates was estimated at $1.544 billion for 1985 by the *ICM, supra* note 16, II. This figure represents 65% of 1985 Class I railroad net operating revenue of $2.361 billion. *See Facts, supra* note 3, I, at 10. The *ICM* analysis uses 1985 rail costs and assumes the nationwide operation of twin 48 doubles at Bridge Formula B weight limits. *See* 23 U.S.C.A. § 127 (1986). Commodity specific loss categories are direct outputs of the *ICM*.

[31] The long-run railroad traffic loss would equal 111 to 123 billion ton-miles, based on the *ICM* analysis, which is roughly 13 percent of 1985 Class I railroad revenue ton-miles. See *supra* note 16 for a description of the *ICM*. See *Facts, supra* note 3, I, at 29 for 1985 Class I railroad revenue ton-miles.

[32] Federal Highway Admin., U.S. Dep't of Transportation, *Update (1984) to the Final Report of the Federal Highway Cost Allocation Study, (May 1982), Report of the Secretary of the Department of Transportation to the United States Congress pursuant to Section 506, Surface Transportation Act of 1978, Pub. L. No. 95-599.*

[33] The 50 percent figure refers to single 48 ATLFs under current weight limits. The 40 percent figure refers to twin 48 ATLFs at Bridge Formula B weight limits. Both figures are IPD/AAR estimates derived from an AAR methodology for calculating revenue to cost responsibility ratios for truck types whose operating characteristics differ significantly from the "average" heavy truck.

The methodology starts from the findings of the Federal Highway Adminstration (FHWA) 1982 Federal Highway Cost Allocation Study (HCAS) and subsequent U.S. Department of Transportation analysis. *See supra*, note 32, II.

The methodology results for four truck types are listed below in the Tax Underpayment Table.

TAX UNDERPAYMENT TABLE

SELECTED TRUCK TYPE 1985
FEDERAL AND STATE HIGHWAY
TAX UNDERPAYMENT

Truck Type	Fed. & State Underpayment Per Revenue Ton-Mile	Fed. & Revenue To Cost Ratio
1. 1:48, FHWA Avg. Truck	.31 cents	.65
2. 1:48, NMTDB Avg. "Rail-Competitive" Truck	.42 cents	.54
3. 1:48, ATLF Truck	.45 cents	.50
4. 2:48, ATLF, BFB Wt. Truck	.46 cents	.40

(All figures are on a per truck basis).

[34] ATLF efficiency gains, a 12.6 percent decrease in truck costs from $1.03 to $0.90 per loaded mile, *supra* note 16, II, would be almost entirely compensated for by the 9.5 percent increase in truck costs that full cost recovery user charges would mean.

The 9.5 percent increase in ATLF costs per loaded mile was calculated as follows:

Additional Federal and state user charges necessary to achieve full cost recovery were estimated at .45 cents per revenue ton-mile. *See* Tax Underpayment Table, *supra* note 33, II. This estimate was multiplied by an average load of 19 tons per truck, *NMTDB* (1985), *supra* note 16, II, to yield an underpayment of 7.98 cents per loaded mile. Truckload marginal costs for the ATLF truck were estimated at 89.7 cents per loaded mile. *See generally supra* note 16, II.

[35] This scenario assumes that: 1) the national trucking industry implements efficient ATLF business practices (See *supra* note 15, II for ATLF business practices); 2) the industry employs twin-48 foot trailers at Bridge Formula B weight limits (*See* 23 U.S.C.A. § 127); and 3) both Federal and state governments impose full cost recovery user fees.

[36] ATLF's employing twin-48 foot trailers operating at Bridge Formula B weight limits would result in truck costs decreasing by 42 percent, from $1.03 to $.60 per loaded trailer mile. *Supra* note 16, II. Full cost recovery user charges would increase truck costs by 14.5 percent, based on the methodology in note 33, II and values of: .46 cents per revenue ton-mile, *see* Tax Underpayment Table, *supra* note 33, II, 38 tons per truck, *see NMTDB* (1985), *supra* note 16, II, and 120.0 cents per loaded mile. *See generally, supra* note 16, II.

The estimate of one-half the losses from the ATLF/Bridge Formula B combination alone (one-half of the $1.5 billion, *see supra* note 30, II) is based on *ICM* analysis. See *supra* note 16, II for a description of the *ICM*.

[37] See Commins, *Barge Firms Report Chem Traffic Shifts*, Journal of Commerce, June 6, 1986, at 2C, for chemical barge rate data. See Smith, *Mississippi Ailing But Still Active*, Bulk Systems Int'l, Jan. 1986, at 17-21, for coal barge rate data.

[38] *See* Commins, *Continued Barge Surplus Predicted*, Journal of Commerce, Feb. 6, 1986, at 8A. *See generally Mississippi Ailing But Still Active, supra* note 37, II.

[39] *Budget of the United States Government, Fiscal Year 1988*, at I-H9.

[40] Program Office, U.S. Army Corps of Engineers, *Inland Waterway Projects: Actual and Projected Expenditures* (1986).

[41] U.S. Dep't of Transportation, *National Transportation Statistics Annual Report* 34 (1986).

[42] See Water Resources Development Act of 1986, § 1404, Pub. L. No. 99-662, 132 Cong. Rec. H11,478, H11,533 (daily ed. Oct. 17, 1986) (twenty cents per gallon tax imposed for use after January 1, 1995). The calculations assume that: the U.S. Army Corps of Engineers annual expenditures are to remain over $700 million in 1995, industry annual revenues will remain at roughly $2.5 billion, and fuel tax receipts will total approximately $100 million annually.

III: RAILROAD RESPONSES

[1] *Facts, supra* note 3, I, at 11.

[2] *Id.*

[3] *See supra* note 21, II. *See also* Bureau of Economic Analysis, U.S. Dep't of Commerce, 64 *Survey of Current Business* 72, 73 (July 1984) and 66 *Survey of Current Business* 65, 66 (July 1986).

[4] *AAR Railroad Cost Indexes*, Table A, at 8 (Mar. 1987); *Economic Indicators, supra* note 16, I, at 23.

[5] The 1980 employment figure of 447,213 was calculated for railroads classified by the ICC in 1986 as Class I Railroads. The detail for this calculation is provided below:

	No. of Employees	Source
1980 Class I Employment	458,994	*Facts, supra* note 4, I, at 56.
Adjustment for Railroads Later Declassified to Class II:		
Bessemer & Lake Erie	1,234	*Analysis, supra* note 13, I, at 68, 70, 71, Line 308, 1980.
Long Island	6,857	
Pittsburgh & Lake Erie	2,069	
Duluth, Missabe & Iron Range	1,621	
Sub Total	11,781	
Adjusted 1980 Class I	447,213	

The Elgin Joliet & Eastern was also declassified late in 1986.

The end of 1986 employment figure of 257,300 was extracted from *Statement No. M-350, supra* note 12, I. Of the total decline, only a small portion, some 1,606 employees, were transferred as a result of line sales to regional roads.

[6] The $8 billion figure was calculated by using the following information on average employment and average employee compensation.

A. Employment Decline 1980 vs. 1986:
Average Railroad Employment:

1980	447,213
1986	274,200
Decline	173,013

The figure of 274,200 is used as it represents average employment for the year, rather than the year-end figure of 257,300.

The decline in employment is slightly overstated as a result of the transfer of some freight employees to passenger and commuter service during the 1980's.

B. Average Employee Compensation:
1986 Estimate $46,000

Source:

A. *See supra* note 5, III; *see also Statement No. M-350, supra* note 12, I.

B. *See supra* note 21, II.

[7] *Trends, supra* note 11, I, at Table III-B-6 (data for year 1986 are estimated).

[8] The 1980 miles of track owned figure of 268,045 was calculated for railroads classified by the ICC in 1986 as Class I Railroads. The detail for this calculation is provided below:

	Miles of Track Owned	Source
1980 Class I Mileage	270,623	*Facts, supra* note 3, I, at 42
Adjustment for Railroads Later Declassified to Class II:		
Bessemer & Lake Erie	434	*Analysis, supra* note 13, I, at 74, 76, 77, Line 343 (1980).
Long Island	694	
Pittsburgh & Lake Erie	672	
Duluth, Missabe & Iron Range	778	
Sub Total	2,578	
Adjusted 1980 Mileage	268,045	

The 1985 miles of total owned figure of 242,320 was taken from *Facts, supra* note 3, I, at 42.

[9] *Facts, supra* note 3, I, at 44, 46.

[10] *Trends, supra* note 11, I, at Table III-A-12, Table III-A-8.

[11] *Facts, supra* note 3, I, at 39.

[12] *Id.* at 40.

[13] *Trends, supra* note 11, I, at Table II-B-6.

[14] *Facts, supra* note 3, I, at 51, 52.

[15] *See generally, Hearings on Formation and Operation of Shortline and Regional Railways Before the Subcomm. on Surface Transportation of the Senate Comm. on Commerce, Science and Transportation*, 99th Cong., 2d Sess. (July 25, 1986) (statements of Edward L. Hurley, Manager, Railroad Management Services Venture Team, L.B. Foster, Co., and John E. Haley, President, Chicago Central & Pacific Railroad Co.).

From 1980 through 1986, eight regional railroads operating 4,793 miles of track and employing 1,606 persons have been created. AAR Special Survey, *Profiles of U.S. Railroads* (Spring 1987).

[16] *America's Railroads-A Blueprint for Change* 5 (1985); *High-Tech Loaders Lift Yard Efficiency*, Railway Age, May 1986, at 40.

[17] Intermodal Reporter, Mar. 16, 1987, at 147; J. Mahoney, *Intermodal Freight Transportation* 45 (1985).

[18] *High-Tech Loaders Lift Yard Efficiency, supra* note 16, III, at 40-41; Welty, *Boosting Terminal Efficiency*, Railway Age, Nov. 1986, at 37.

[19] *Intermodal Freight Transportation, supra* note !7, III, at 151-153; Malone, *Trailers/Containers: Sizing Up Tomorrow's Fleet*, Railway Age, Mar. 1985, at 42; Shum, *Profitability and Growth in Intermodalism*, Progressive Railroading, Nov. 1985, at 32; *Boosting Terminal Efficiency, supra* note 18, III, at 36.

[20] "Total railroad freight claims have declined dramatically . . . . In 1979, 2.1 million new claims were filed against railroads. There was a steady decline through 1984 when slightly under half a million claims were filed. And the ratio of loss and damage payments to freight revenues plummeted during the same period from 1.20% to .49%." Fahrenwald, *Intermodal Loss & Damage Claims Create a Tangled Web*, Intermodal Age, Mar/Apr. 1986, at 21-22. *See also infra* note 28, III.

[21] *A Turnaround Led by Coal Cars*, Railway Age, Jan. 1987, at 35.

[22] *Diesel-Electric Locomotive: The Car & Locomotive Cyclopedia* 531 (1984); *Trends, supra* note 11, I, at Table III-A-8.

[23] Welty, *High Tech at the Head End*, Railway Age, May 1985, at 38; Armstrong, *Rail Lubrication: The Biggest Thing Since Dieselization*, Railway Age, August 1985, at 46-51; Southwest Research Institute, *Alternative Fuels Research, Rail Energy Technology Conference II*, May 20-22 1986, at II-3 to II-7.

[24] *Coming: Head Hardened Rail*, Railway Age, Sept. 1986, at 55; *Toward the 'Smart' Rail Maintenance System*, Railway Track and Structures, Nov. 1986, at 21; Dick, *Engineers Face Reduced Programs Pursue Cost-Cutting Issues*, Railway Track and Structures, Jan. 1987, at 24; Armstrong, *Crossties: The Concrete Challenge*, Railway Age, Nov. 1984, at 67.

[25] *CAT 09 Working Up a Storm*, Railway Age, Sept. 1986, at 51; Welty, *Making Tracks for Improved Productivity*, Railway Age, Mar. 1986, at 33.

[26] Malone, *Computers Come to the Aid of Santa Fe Supers*, Railway Age, May 1985, at 42-45; Malone *CAD Centers Multiply*, Railway Age, Aug. 1986, at 71-76.

[27] *TTC Revisited*, Railway Track and Structures, Feb. 1987, at 33.

[28] *Intermodal Freight Transportation, supra* note 17, III, at 154; Welty, *High Productivity Railroading*, Railway Age, Jan. 1986, at 32-33.

[29] AAR News Release, *High Productivity Intergal Train Project Brings Major Railroad Cost Savings* (Apr. 17, 1987).

[30] Welty, *ATCS: A Management Tool*, Railway Age, Oct. 1986, at 35, 37, 39, 81.

[31] Office of Safety, Federal Railroad Admin., U.S. Dep't of Transportation, *Accident/Incident Bulletin, No. 154, Calendar Year 1985*, at 10 (July 1986).

[32] *Id.* at 5, 10, 14.

[33] *Id.* at 37.

[34] *Id.* at 10.

[35] *Trends, supra* note 11, I, at Table III-E-13.

[36] *High Productivity Railroading, supra*, note 28, III, at 31. *See also Facts, supra* note 3, I, at 44, 46.

[37] Welty, *The Intermodal Revolution*, Railway Age, May 1984, at 35.

[38] The statistics are from the Trailer Train Company, *Form 10-K, Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1984*, for the year ending December 31, 1982, at 5 (1978 data) and for the year ending December 31, 1986, at 4 (1984 data).

[39] Public opinion survey done by Hamilton, Frederick & Schneiders of 100 randomly selected railroad shippers throughout the U.S. (Mar. 1987).

[40] AAR, *Railroad Freight Rates in the Five Years Since Staggers* 4 (1986) [hereinafter *Rates*].

[41] *Id.* at 6.

[42] *Id.* at 8, 10.

[43] The 8.3 percent figure compiled from Bureau of Statistics, Dep't of Labor, *Freight Rate Index*, all commodities, as adjusted by the AAR to incorporate the findings of special AAR railroad studies of grain rates and coal rates. The AAR designed the special studies (coal and grain), and the accounting firms of Deloitte Haskins and Sells (1984) and Price Waterhouse (1985) collected the confidential rate data from individual railroads and compiled the indices in accordance with the designed methodology. In 1986, AAR collected the confidential rate data and compiled the indexes. The adjusted BLS Freight Rate Index reflects the replacement of the BLS component for coal by the AAR coal index since 1981 and replacement of the BLS component for grain by AAR grain index, since 1984. The weights used in the BLS index for grain and coal were not changed.

The railroad coal rate increase of 6.3 percent was taken from the AAR, *Railroad Coal Rates in the Competitive Marketplace* (1987) [hereinafter *Coal Rates*].

The 21.3 percent increase in electric rates was compiled from Edison Electric Institute (EEI), 49 *Total Electric Utility Industry in the United States Including Alaska and Hawaii* (1980 data), EEI, 50 *Quarterly Statistical Report* (1981 data); EEI, 54 *Quarterly Statistical Report* (1986 data), using statistics developed on the average revenue per kilowatt-hour sold to the ultimate customers.

Statistics used in text are based on comparisons from October to October for the year cited.

[44] The 5.1 percent decline in real railroad freight rates as a whole and the 6.9 percent decline in real coal rates were calculated by deflating the BLS adjusted Freight Rate Index, *see supra* note 43, III, and Coal Freight Index, *see Coal Rates, supra* note 43, III, by the Railroad Cost Recovery Index (RCR), found in AAR, *Railroad Cost Indexes* (Mar. 1987).

[45] The 44 percent drop in real grain rates between 1980 and 1986 was calculated using data on grain rate decreases, *see Rates, supra* note 40, III, at 12, deflated by the RCR. Data from 1981 were not available.

[46] *Rates, supra* note 40, III, at 18, 19.

IV: THE CHALLENGE

[1] *See supra* note 16, II and accompanying text.

[2] *See* section 202, 94 Stat. at 1900 (codified at 49 U.S.C. § 10709(d)(2) (1982)).

[3] 49 U.S.C. § 10709(c) (1982).

[4] *See* section 101a(1), 94 Stat. at 1897 (codified at 49 U.S.C. § 10101a(1) (1982)); *see also Verified Statement of William J. Baumol and Robert D. Willig* 2, in Appendix to Comments of Association of American Railroads in Ex Parte No. 347 (Sub-No. 2), *Rate Guidelines - Non-Coal Proceedings*, submitted Aug. 20, 1986.

[5] *See supra* note 12, INTRO and accompanying text.

[6] Quantification of ceilings on revenue to variable cost ratios was taken from the latest decision of the ICC in Ex Parte No. 399, *Cost Recovery Percentage*, served Dec. 31, 1986. Using a revenue reduction process, the Commission determined that $996 million, $1,504 million, and $2,875 million of revenue would be lost by placing caps on revenue to variable cost ratios at the 200%, 180%, and 150% levels, respectively. Subtracting these

amounts from the industry's operating income of $1.4 billion yields the following estimates of railway operating income.

Revenue/ Variable Ratio CAP	Estimated Revenue (Lost) (millions)	Estimated Railroad Oper. Income (millions)
200%	$ (996.0)	$431
180%	(1,504.0)	(77)
150%	(2,875.0)	(1,448)

The estimated 1985 average revenue to variable cost rates for the rail industry of 150 percent was extracted from the ICC's decision in Ex Parte No. 394 (Sub-No. 1), *Cost Ratio For Recyclables-1983 Determination*, served June 19, 1985. Specifically, in Appendix D to the decision, the ICC found that an *average* overall ratio of revenue to variable expenses of 153.4 percent would be necessary for rail carriers to realize in order to cover total operating expenses plus a reasonable profit. Railway operating income equals net revenues from operation before taxes less fixed charges.

The statement that Railroad Retirement cost employers almost 180 percent more than Social Security is based on the following calculations of the average cost to the employers of an employee under each system.

	Tax Rates	Employees Earnings Base
Employer Cost		
i Railroad Retirement	7.15% (Tier 1)	$42,000
	14.75% (Tier 2)	31,500
ii Social Security	7.15%	$42,000
iii Average 1986 Railroad Employee Compensation (without benefits)	$36,000	
iv Employers' Annual Cost		
Railroad Retirement	$7,220	
Social Security	2,574	
v Percent Increase over Social Security	180%	

The statement that Railroad Retirement costs the employee 52 percent more is based on the following calculation.

	Tax Rates	Employees Earnings Base
Employee Cost		
i Railroad Retirement	7.15% (Tier 1)	$42,000
	4.25% (Tier 2)	31,500
ii Social Security	7.15%	$42,000
iii Average 1986 Railroad Employee Compensation (without benefits)	$36,000	
iv Employers' Annual Cost		
Railroad Retirement	$3,915	
Social Security	2,574	
v Percent Increase over Social Security	52%	

Sources: (i)-Railroad Retirement Tax rates and Earnings Base taken from *Tax rates and earnings bases under railroad retirement, social security, and railroad unemployment programs, 1973 and thereafter*, a table prepared by Bureau of Actuary, Bureau of Research and Analysis, U.S. Railroad Retirement Board (Nov. 1986). (ii)-Social Security Tax rates and Earnings Base. *Id*. (iii)-Average Railroad Compensation (without benefits) (Estimated by AAR using *ICC Annual Wage Statistics, Forms A and B* (1986)). (iv)-Calculation based on tax rate times average compensation.

Railroad Retirement Board, *Annual Report on the Actuarial Status of the Railroad Retirement System Submitted to the United States Congress, Pursuant to Section 502 of the Railroad Retirement Solvency Act, Pub. L. No. 98-76* (1986).

Based on a study prepared for AAR by Towers, Perrin, Forster & Crosby, Actuaries. Study estimated the effect the cost of privatizing the Tier II portion of the Railroad Retirement Fund and the non-Social Security components of Tier I on an ERISA basis. Preliminary results indicate Tier II taxes would be increased to 35.5 percent, a 87 percent increase over the current employee/employer contributions (4.25 percent and 14.75 percent for a total of 19.0 percent), representing an additional annual cost of over $1.5 billion.

The Fiscal Year 1988 Budget of the United States Government, Supplement states:

> "To protect the solvency of the fund, the administration proposes to increase rail pension contributions 1.5 percent effective January 1, 1988 and an additional 1.5 percent effective January 1, 1989. These changes are estimated to increase receipts $0.1 billion in 1988 and $0.3 billion in 1989, Id. at 4-18.

Data taken from the ICC, *Transport Statistics in the United States* (1970 and 1985 eds.).

The Princeton Transportation Network Model (PTNM) was used in conjunction with the 1985 Enhanced ICC Carload Sample (EICS) to determine nationwide loaded rail traffic flows. Levels of core networks were then simulated by eliminating routes starting with the lowest densities.

The resulting nationwide traffic patterns were arrived at by eliminating from the traffic data base any carloading that had either its origin or its termination in the eliminated portion of the network.

A description of the EICS can be found in O. Williams, *Enhancement of the 1985 ICC Waybill Sample* (1986). See also *The Princeton Railroad Network Model: Application of Computer Graphics in the Analysis of a Changing Railroad Industry* (1983), for a description of the PRNM.

Id.

See Consumer Rail Equity Act, H.R. 1393, § 10, 100th Cong., 1st Sess. (1987), S. 676, § 10, 100th Cong., 1st Sess., 133 Cong. Rec. S2839, S2841 (daily ed. March 6, 1987) (requires one year moratorium after denial of abandonment, local hearing and line specific financial data). Also, the Interstate Commerce Commission has recently adopted new abandonment costing regulations which the railroads oppose. *See* Ex Parte No. 274 (Sub-No. 11), *Abandonment Regulations - Costing*, served Jan. 23, 1987 (reclassifying equipment return on investment as economic cost instead of avoidable cost and deciding to use real cost of capital, instead of nominal cost, in calculating rate of return).

See Burlington Northern R.R. v. Brotherhood of Maintenance of Way Employees, 55 U.S.L.W. 4576 (U.S. Apr. 28, 1987) (holding Norris-LaGuardia Act prohibits Federal court from enjoining secondary picketing under Railway Labor Act).

See 45 U.S.C. §§ 51-60 (1982) (fault-based tort system).

See generally Schwartz and Mahshigian, *The Federal Employers' Liabilty Act, a Bane for Workers, a Bust for Railroads, a Boon for Lawyers*, 23 San Diego L. Rev. 1 (1986).

The CHAIRMAN. Thank you,, Mr. Dempsey.

Now, let's go to Mr. Lema whether I would like for him to deal with that question just discussed, and otherwise summarize your testimony, if you will, Mr. Lema.

STATEMENT OF JOSEPH E. LEMA, VICE PRESIDENT FOR TRANSPORTATION, NATIONAL COAL ASSOCIATION, ON BEHALF OF THE AMERICAN MINING CONGRESS

Mr. LEMA. Thank you, Mr. Chairman.

Mr. Chairman and members of the committee, my name is Joseph E. Lema. I am vice president for transportation of National Coal Association. I am appearing before the committee on behalf of both National Coal Association and the American Mining Congress. NCA and AMC represent most, if not all, of the major coal producers in the U.S.

And certainly, Mr. Chairman, I will be delighted to respond to the point you asked Mr. Dempsey.

Let me summarize my testimony by saying, first of all, that NCA and AMC support wholeheartedly granting Federal eminent domain authority for interstate coal pipelines certified to be in the national interest. Therefore, we urge the committee to report favorably S. 801, the Coal Distribution and Utilization Act of 1987.

Our reasons for doing so, as I indicated earlier, are expressed in detail in the statement filed with the committee, which I will just summarize. I request that the full written statement be incorporated into the hearing record as filed.

The CHAIRMAN. Yes, it will be.

Mr. LEMA. We believe that there are four compelling reasons today to enact S. 801. Each of these reasons that make it particularly desirable, appropriate and timely—and I would emphasize "and timely"—to enact the legislation has a common foundation in the critical, strategic importance of expanding utilization of abundant, secure coal reserves in the United States.

First, to enhance our national security by reducing our dependence in future years on unstable sources of imported fuel; second, to improve our balance of trade through higher U.S. coal exports and lower energy costs involved in production of various items by U.S. manufacturers; third, to facilitate the application of clean coal technologies through distribution of coal rich liquid fuels efficiently handled by pipeline systems; and fourth, to enable the utilization of a transportation technology, coal pipeline, which has been shown to be efficient and competitive with other transportation modes.

We have about 488 billion tons of minable coal reserves in the United States. Yet, in the 1980's our annual production of coal has been approximately 800 to 900 million tons notwithstanding that our coal production capacity already stands at more than 1 billion tons yearly. Further, we have had substantial increases in coal mining productivity marked by a 42-percent gain in tonnage per person per day in the period 1980 to 1985.

So, we have vast coal reserves, underutilized capacity for producing coal, and at the same time an undesirable dependence on imported fuel which U.S. coal can ameliorate in our search for energy independence.

Certainly the energy crises in 1973 and in 1979 and a new crisis today in the Persian Gulf region demand dictating renewed vigor in seeking broader utilization of U.S. coal, an aim on which S. 801 is directly focused.

Now, with respect to our balance of trade deficit, coal produced in the United States can materially reduce the trade imbalance through expansion of coal exports. We have seen coal exports of 112 and 106 million tons annually in 1981 and in 1982 fall off to the 75 to 90 million ton range annually since 1983. That has occurred notwithstanding a 21-percent drop—that's a 21-percent drop—in average coal prices at the mine from 1980 to 1985 in constant dollars, greatly expanded terminal capacity at U.S. coal ports built in the 1980's, and continued high competitiveness in ocean freight rates.

The CHAIRMAN. Mr. Lema, let me interrupt you at that point because I am afraid we are going to run out of time. And your statement will be in the record.

[The prepared statement of Mr. Lema follows:]

Statement of
Joseph E. Lema
Vice President for Transportation
National Coal Association

On S. 801, The "Coal Distribution And Utilization Act of 1987"

Before the
Committee on Energy and Natural Resources
United States Senate

September 10, 1987
Washington, D.C.

Mr. Chairman and Members of the Committee, my name is Joseph E. Lema. I am the Vice President for Transportation of National Coal Association (NCA). I am appearing before the committee today on behalf of NCA and the American Mining Congress (AMC). NCA and AMC together represent most, if not all, of the major coal producers in the U.S.

NCA and AMC support the enactment of legislation which will provide federal eminent domain authority to assist in acquiring rights-of-way needed for construction of interstate coal pipelines. We urge the committee to report favorably on S. 801, the "Coal Distribution and Utilization Act of 1987." The bill would grant eminent domain authority for coal pipelines in the same sense that railroads, highways, oil and gas pipelines, and transmission lines have been aided in their development.

Greater need exists today than ever before in the quarter century struggle to enact coal pipeline eminent domain legislation. Without eminent domain, it is seriously doubtful that coal pipelines will be built due to the enormous difficulties encountered in acquiring, or gaining access to, contiguous lands spanning substantial mileage which the pipelines would traverse.

We wish to call the committee's attention to four points which show that S.801 is particularly critical and strategic at this time.

- First, coal pipelines will be a strategic factor in the improvement of the energy security of the United States. Pipeline distribution of coal and coal-based fuels promises to significantly enhance the utilization of our abundant, secure coal reserves, thus contributing to our energy independence by reducing our consumption of imported fuels.

- Second, coal pipelines will increase the competitiveness of the U.S. in world markets providing additional competition in the transportation of coal produced in the U.S. Additional benefits would accrue to our economy - more competitive U.S. coal and U.S. products would improve the U.S. balance of trade.

- Third, coal pipelines will facilitate progress in applications of clean coal technologies through efficient distribution of coal-rich mixtures of microfine coal blended with water and chemical additives, which are directly combustible in utility and industrial facilities. Coal pipelines represent highly utilitarian systems for distributing such coal-based fuels from preparation plants located in the mine fields to storage terminals and end users, just like pipelines are used now to distribute petroleum products and natural gas.

- Fourth, coal pipelines represent proven technology for transporting coal efficiently. The Black Mesa Pipeline in the west today carries about 5 million tons of coal annually for a distance of 273 miles from the mine field to an electric utility plant in an area where no railroad transportation is available for the movement. Coal pipelines, in some instances, would constitute viable alternatives and competition with existing coal transportation services.

The first of the four points just mentioned on the timeliness and importance of enacting S. 801 focuses on a well recognized national need for energy independence. U.S. coal is well positioned to contribute toward reaching that goal. It is estimated that we have about 488 billion tons of minable coal reserves in the U.S. Our coal production has been in the 800 to 900 million tons range annually in the 1980s, and we already have mining capacity in place to produce more than one billion tons yearly. Coal mining productivity measured in tons per person per day has increased by 42 percent from 19[illegible] to 1985. Our coal reserves are plentiful, our capability to produce coal efficiently is well documented, and the need to reduce fuel imports is abundantly obvious.

We need but look at the conditions prevailing today in the Persian Gulf Region to strengthen our resolve to achieve energy independence. The goal of energy independence was established years ago by President Nixon in Project Independence whose objective was to create an "energy free America" by reducing and ultimately eliminating the dependence of the U.S. on imported oil. Coal was to be the keystone.

The crisis of 1973 gave early impetus to the program, but public interest waned when petroleum became more available. Then we faced a second crisis in 1979, but again the impetus for dealing with the problem diminished as the crisis faded. Now, in 1987, we are again in the throes of an energy-oriented crisis due to the volatile situation in the Persian Gulf Region. The crises of 1973, 1979, and 1987 surely demonstrate the imperative of considering energy to be a strategic commodity for the security of our nation. Reliance on oil, or otherwise stated, inflexibility in energy, is a strategic vulnerability.

We should not linger on the course of overcoming that vulnerability; rather we must act affirmatively to resolve our energy problem in several ways, one of which certainly should be to utilize to a much greater degree our abundant, secure coal reserves. The "Coal Distribution and Utilization Act of 1987" now before this committee would be a positive contribution in our march toward energy independence.

The second point regarding S.801 is the valuable role the legislation will play in increasing the competitiveness of the U.S.. Inland transportation typically represents about one-third to one-half of coal's delivered price, whether to utility and industrial facilities or to port terminals for exports to other countries. Coal pipelines, due to their competitiveness, can be an effective force in holding down transportation costs and lowering the delivered price of U.S. coal. There are several potential benefits: increasing the U.S. share of world coal markets; increasing the competitiveness of U.S. manufacturers through lower electricity costs in production; and lowering electricity rates for consumers.

U.S. coal exports are currently facing intense competition from coal produced elsewhere, notably in traditional coal export countries as Australia, Poland, and South Africa, and recently in Colombia and China. Since 1980 we have seen a yearly high of more than 112 million tons of coal exports in 1981 and more than 106 million tons in 1982 drop to a annual range of approximately 75 to 90 million tons. In 1985 Australia has replaced the U.S. as the world's leading coal export nation.

Ironically, the decrease in recent years has occurred notwithstanding major expansion in terminal capacity for handling export coal, and a productivity increase in coal extraction of 42 percent from 1980 to 1985, accompanied by an average drop of 21 percent in mine prices for coal in constant dollars. The result, unfortunately, has been a loss to the potential improvement in the U.S. balance of trade and reduced domestic activity in the coal export chain. Over the period, again expressed in constant dollars, railroad coal freight rates have remained virtually unchanged, notwithstanding improvements in rail productivity of 39 percent in revenue ton-miles per employee-hour paid, 19 percent in revenue ton-miles per gallon of fuel consumed, and 11 percent in revenue ton-miles per railcar loaded. This dichotomy between mine prices and rail rates in the face of significant gains in productivity by coal producers and coal-carrying railroads is compounded by the fact that railroad productivity changes are for all railroad freight, whereas railroad coal freight is handled much more efficiently than other commodities. This apparent absence of railroad responsiveness to market pressures results from the coal industry's widespread captivity to the railroads for transportation services which enables railroads to charge unrestrained rates in the absence of effective competition. S.801 will help ameliorate this condition in situations where coal pipelines can be constructed and operated profitably.

This legislation has unique appeal. It does not create any new federal program. It does not call for government financing. It simply eliminates barriers to enabling coal pipelines to be built by private sector interests. Construction of coal pipelines will enhance the competitiveness of coal transportation and thereby improve the competitiveness of U.S. coal itself in selected domestic and world markets. They promise to be contributors toward recovering lost market shares and gaining new markets. To recover some of the 20 to 30 million tons of coal exports lost annually over the past five years and expand our share of world coal markets, we must reduce inland transportation costs. This objective will be aided by facilitating coal pipeline development through granting eminent domain authority to pipelines certified to be in the public interest.

A third point in support of enacting S.801 is to facilitate applications of clean coal technologies. We have just begun a program to demonstrate the use of clean coal technologies. These projects are critical to broadening the utilization of U.S. coal in an environmentally acceptable manner. In the 1980s several new coal-based fuel technologies have been developed which blend microfine coal with water and chemical additives. These technologies will hold coal in suspension and preserve the homogeneity of the mixture, thus assuring suitable viscosity in a liquid state over long periods of time, up to about 120 days after preparation. Just as pipelines are utilized to distribute petroleum products and natural gas, with which coal must compete, coal pipelines will be an exceptionally efficient means of distributing coal-based fuels from preparation plants to storage and end user facilities.

These coal-based fuels have several unique advantages. They can be produced in the coal fields where coal is mined, thus reducing the need to transport raw or beneficiated coal in solid bulk state. The coal-based fuels are coal-rich compared with traditional slurry coal. They contain up to 75 percent coal rather than 50 percent coal in the slurry mixture, and the coal-rich fuels are directly combustible, eliminating any need for dewatering the slurry mixture at the end user's plant. The technology promises a coal-rich liquid fuel produced where coal is mined; transported at less cost; and consumed with reduced requirements for storage and waste disposal at utility and industrial plant locations. S.801 would be a catalyst toward achieving broader utilization of new coal-rich liquid fuels by enabling pipelines to acquire necessary lands or access to lands for their construction from mine fields, across state lines, to domestic consumers and to ports for export.

The final point in the family of reasons to enact S.801 now is the desirability of taking early advantage of a proven technology available to move large amounts of coal many miles efficiently. Years ago the Cadiz Pipeline successfully carried coal from mines located in Ohio to a Cleveland utility, just as today the Black Mesa Pipeline moves about 5 million tons of coal annually for a distance of 273 miles where no railroad services are available in the west. In addition to the fact that coal pipelines have been shown to represent efficient, competitive transportation systems, they offer the unique advantage of being non-intrusive with respect to the lands and the communities they traverse because they are buried in their rights-of-way.

Therefore, coal pipelines do not disrupt other surface traffic in their operation, and they constitute a highly safe method of moving large tonnage without conflicts with vehicular or pedestrian traffic. Their aesthetic characteristics are also positive in regard to areas where they are built because pipelines, most often, are buried, creating no visual obstructions in the landscape. Further, coal pipelines can be operated while still allowing use of the lands in which they are buried for agriculture and other surface land uses, a factor that again enhances their utilization in contrast with railroad and highway transportation.

Railroad mergers and consolidations over a 15-year period have created five major railroad systems which now handle more than 85 percent of total railroad coal tonnage: CSX Corporation, Conrail, and Norfolk Southern in the eastern coal-producing states; and Burlington Northern and Union Pacific in the west. Each of these coal carriers holds market dominance over coal movements in their service areas since rail-to-rail competition is rare except for a limited portion of the Powder River Basin in Wyoming. Navigable rivers are not available to many coal producing regions for barge movements, and trucks are not suitable for moving large volumes of coal for long distances. The transportation situation makes it desirable and appropriate to enact S.801 and facilitate construction of coal pipelines in locations where they are economically feasible.

Railroads now carry two out of every three tons of coal transported from the mines, and are expected to continue both to enjoy the major share of total coal traffic and to possess market dominance over much of the coal they transport. Coal pipelines will essentially play a role in handling shares of increased coal production, either in traditional 50 percent coal and 50 percent water mixtures or in new coal-rich liquids having up to 75 percent coal in their formulation. That is why NCA supports S.801, as well as pending legislation to repeal the railroad's immunity from lawsuits brought by shippers under antitrust laws and to amend the Interstate Commerce Act to provide captive shipper protection in the absence of transportation competition.

Our posture with respect to coal transportation is clear and consistent. We believe that competition, i.e. the marketplace, is the best choice for assuring that carriers are efficient and rates are reasonable. Accordingly we support granting eminent domain authority to facilitate construction of coal pipelines, and we support repeal of the Keogh Doctrine which shields the railroads from antitrust laws, an especially objectionable circumstance when one considers that the railroads have been largely deregulated under the Staggers Rail Act of 1980. However, we are realists and recognize that the railroads likely will continue to hold market dominance over particular traffic, including many coal movements, in the future. Therefore, we are major proponents of the Consumer Rail Equity Act which is simply aimed at providing effective captive shipper protection where there is a lack of transportation competition. The legislation requires that the Interstate Commerce Commission furnish timely recourse for shippers where railroad market dominance exists and the carrier subjects the shipper to unfair or inequitable treatment in violation of the law and contrary to the intent of the Congress.

Those who say that the "Coal Distribution and Utilization Act of 1987," the "Consumer Rail Equity Act of 1987," and the "Clayton Act Amendments of 1987" are not warranted are, for the main part, the railroads themselves who wish to dismiss the legislation saying that there is no captive shipper problem because there are no captive shippers, and even if there were, the carriers would not treat them badly. The record shows things differently. To begin with, why should the railroads legitimately oppose S.801? The likely reason is that they wish to stymie competition from coal pipelines. It is interesting to note that one of the five major, long-haul, coal-carrying railroads mentioned earlier has withdrawn its earlier opposition to such legislation, and the same railroad in the last two years has been facing new rail-to-rail competition in a portion of its service area high in western coal production. In fact, in that same coal-producing area where new rail-to-rail competition has been introduced, railroad coal rates have declined about 20 to 25 percent, clearly showing the salutary impact competition has on coal transportation and the delivered price of coal, including the mine price and the transportation costs.

Mr. Chairman and members of the committee, the value of greater competition for movement of coal is unquestionable with reference to a gamut of public interests including national security through energy independence, our economy through bettering our balance of payments in world trade, savings to consumers through lower rates for electricity, and our environment through advancement of new clean coal technologies. S.801, the "Coal Distribution and Utilization Act of 1987," will stimulate additional transportation competition by enabling construction of coal pipelines and promote greater use of U.S. coal. In closing, we reiterate that the legislation is desirable, appropriate, and well timed. Thank you for hearing our views.

The CHAIRMAN. I would like for you to deal with that question of the ICC and their rule on coal slurry pipelines.

Mr. LEMA. I would be glad to do that, Mr. Chairman.

The ICC in a regulatory proceeding decided in September of 1985—ruled that when you look at maximum rate reasonableness charged by railroads for coal traffic—just for coal traffic, not other traffic. They have not found out how to look at maximum rate reasonableness for other traffic. They just found a way to look at it for coal traffic.

Well, they said instead of looking at the actual costs incurred by the rail carrier in providing the railroad service which, of course, we prefer that they do, instead of that, they don't look at actual costs. They look at a simulated, least-cost alternative. That is called standalone costing in the ICC's vernacular.

This look at a simulated least-cost alternative is done to determine if the coal shipper complaining of an excessively high railroad rate could have moved the coal some other way, although the other way doesn't exist. It has got to be simulated. And that other way could be by another railroad that he could theoretically construct or by another transportation system such as a barge facility or a pipeline facility.

So, I believe it is inaccurate to say that railroads today under ICC's standalone costing methodology for determining rail rate reasonableness have to bring their rates down to the pipeline—or would have to bring their rates down to what a pipeline would charge. They actually can still demonstrate by their efficiency, by the fact that they have amortized their investment to date, that they can compete with the pipeline services should they ever be built.

So, I don't think it is fair to say that the railroads in the future would face an unfair application of the ICC standalone costing——

The CHAIRMAN. Well, has anybody ever tried it? And does it work?

I mean, there is something that doesn't add up here. Mr. Dempsey says don't worry about it because you can get down to the lowest rate that the coal pipeline could give you. Yet, we are going to lose jobs if you permit them. And that doesn't figure. And you say, well, it is not right because they ought to do it by costs.

Now, can they do it or can't they do it?

Mr. LEMA. Well, I maintain that under the ICC's regulatory proceeding on maximum rate reasonableness that—and it has been tried twice now. And the railroads, who were accused of having charged excessively high rates, had to lower their rates because under the simulated least-cost alternative, the shipper was able to show that the would have paid less, but paid less by using a rail carrier, a simulated, theoretical rail carrier.

There has been no test yet made of the comparison of an existing railroad rate for coal with a simulated or real coal pipeline.

The CHAIRMAN. It has not been tried?

Mr. LEMA. No, sir.

The CHAIRMAN. Why not?

Mr. LEMA. I expect it will be. I cannot give you a reason for it not having been to date.

The **Chairman**. All right, let's now move to Mr. Richard I. Kilroy, chairman of the Railway Labor Executives' Association.

STATEMENT OF RICHARD I. KILROY, CHAIRMAN, RAILWAY LABOR EXECUTIVES' ASSOCIATION

Mr. **Kilroy**. Thank you, Mr. Chairman.

I will be brief as the chairman has requested, and will not read my statement.

I want to point out that the RLEA represents 19 railroad unions. All except two are affiliates of the AFL-CIO. The AFL-CIO takes no position, as you probably have been informed, with respect to the coal pipeline legislation. And so, I do speak for all of the railworkers in the rail industry.

I will concentrate my testimony, as my statement does, with respect to jobs. In 1985 for the first time proponents of the pipeline said it was a jobs bill. It wasn't a jobs bill then. It is not a jobs bill now.

Our facts are taken from the OTA report, which was presented in 1978, and they are probably just as valid or even more so today than they were then.

The employment in the rail industry has dropped some 40 percent, a little over 40 percent in the last 8 to 10 years.

We have a very, very serious situation with our railroad retirement system. A commission is being established to study it to find out what we can do about it. We have more than three beneficiaries now for each railworker that is working.

And the facts will show that there is actually a job loss of about 70,000 permanent jobs versus some permanent jobs that might be established by the pipeline, but in the long run there is a net loss in jobs. So, it is not a jobs bill.

Not only that, if you take the prime product, a haul by railroads, in this country away from them, then we foresee more mergers, bankruptcies and what have you as the railroad industry itself—many of the railroads, particularly the small ones are in a difficult situation. I don't say that about the big ones, but I do say that about many of the small ones.

If we eliminate the ability of railroads to operate in this country, then we do threaten our national security, our national defense, and our national economy. The railroads are a common carrier. The pipeline will be a carrier of one single product. You won't be able to put troops or ammunition or military equipment in a pipeline in case of an emergency. So, it seems to me that we need to devote our attention more to the railroad industry as more than just a coal hauler. It hauls grain. It hauls everything else that is essential to the economy and health of the Nation.

And naturally, as labor representatives, we are interested in jobs. And we believe that the facts show very clearly that there will be a net loss in jobs to the detriment of the people we represent.

I disagree with my colleague, Marvin Boede of the AFL-CIO, and I think that there is a short-term gain for construction workers, of course. And I don't blame him for wanting to get more work for them. But it is going to be a long-term loss for rail workers.

And I think the committee has heard arguments or Congress has heard arguments now for probably 20 years. The arguments have not changed very much, as I view them. Some technology may have developed in that time, but the arguments seem to be the same.

And we would refer back to previous arguments. We have testified here many, many times as to why we oppose this bill or similar bills, and we oppose the enactment of this Bill 801.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Kilroy follows:]

BEFORE THE
UNITED STATES SENATE

SUBCOMMITTEE ON SURFACE TRANSPORTATION
OF THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
ON S. 801

STATEMENT OF RICHARD I. KILROY, CHAIRMAN
RAILWAY LABOR EXECUTIVES' ASSOCIATION

SEPTEMBER 10, 1987

My name is Richard I. Kilroy. I am Chairman of the Railway Labor Executives' Association and International President of the Transportation-Communications Union. I am accompanied by William G. Mahoney, counsel to the Railway Labor Executives' Association. I present this statement on behalf of the Railway Labor Executives' Association in opposition to the enactment of S. 801.

The membership of the Railway Labor Executives' Association consists of the chief executive officers of nineteen standard national and international railway labor organizations. They are:

American Railway & Airway Supervisors Association, Division of TCU
American Train Dispatchers Association
Brotherhood of Locomotive Engineers
Brotherhood of Maintenance of Way Employes
Brotherhood of Railroad Signalmen
Brotherhood Railway Carmen, Division of TCU
Hotel Employees & Restaurant Employees International Union
International Association of Machinists and Aerospace Workers
International Brotherhood of Boilermakers & Blacksmiths
International Brotherhood of Electrical Workers
International Brotherhood of Firemen & Oilers

International Longshoremen's Association
National Marine Engineers' Beneficial Association
Seafarers International Union of North America
Sheet Metal Workers' International Association
Transport Workers Union of America
Transportation-Communications Union
United Transportation Union, Yardmasters Department
United Transportation Union

I appear before you today to express the opposition of the membership of RLEA to legislation which would extend the power of federal eminent domain authority to privately owned coal slurry pipeline companies. The most pernicious aspect of this proposal is that it masquerades as a jobs bill. Nothing could be further from the truth. This Act, if passed, will cost jobs, not create them.

The private carriers advantaged by this grant of federal eminent domain authority would direct their efforts at capturing the most profitable long-haul, high-volume coal traffic; traffic traditionally transported by this nation's railroads.

It is our conviction that the passage of such legislation in these times would not be in the public interest generally, and would, in fact, result in a net loss of jobs.

The RLEA has testified many times before on the subject of coal slurry pipeline legislation. S. 801 is very similar to those earlier legislative proposals which have consistently failed of enactment. Indeed, the latest Congressional rejection of similar legislation was by the House on September 27, 1983, when by a vote of 235 to 182 with abstentions, it defeated enactment of H.R. 1010. The record already made on this subject is just about the most complete record available on any piece of legislation ever presented to the Congress. The detailed substantiated evidence supporting rejection of S. 801 and earlier similar legislation as unneeded by and, indeed harmful to, the public interest we believe to be overwhelming.

The figures and methodology which we use in this testimony are derived from advocates and opponents of coal slurry pipelines, as well as the perhaps more objective conclusions of the 1978 OTA Report.

The impact upon railroad industry employment caused by the existence of coal slurry pipelines must be considered from two aspects: first, the direct impact occasioned by the diversion of coal transport from trains to pipelines resulting in fewer coal trains and therefore fewer on-train jobs and off-train support positions (including car and engine construction lost as a result of the diversion); and, second, the effect of the loss of revenues upon a railroad's financial health and the efforts which must be made by that railroad to bring its costs in line with its reduced income. In the railroad industry this situation has historically resulted in severe maintenance reductions by the furloughing of maintenance of way and equipment employees.

The 1978 OTA Report has been extensively quoted and relied upon by opponents of coal slurry pipelines since its issuance. That report concluded that the five pipelines then being considered for construction would by the year 2000 result in the loss of some 16,000 railroad jobs at a time when employment in the industry would be about 365,660. But employment in the railroad industry is now nearly as low as that then predicted by OTA for the year 2000, having plummetted from 514,000 in July 1981 to 388,000 in January 1983; a drop of 25% in 18 months. It is even less than that today. Some 70,000 railroad employees are now on furlough. Consequently, in the year 2000 some 6% of the railroad work force could lose their jobs because of the construction of only 5 coal slurry pipelines.

Because of the adverse impact the construction of slurry pipelines would have on railroad employment, at a minimum an amendment to S. 801 is necessary to protect the employees affected by this Act of Congress. Such an amendment should require as a condition of the receipt of eminent domain authority that the applicant provide protection to affected rail employees at least as protective of their interests as the protection afforded in rail consolidation and merger cases under the Interstate Commerce Act.

It is claimed by some supporters of the coal slurry pipeline legislation that it is a jobs bill. It has been claimed that construction of planned slurry lines will produce 500,000 new jobs, including 50,000 direct construction jobs and 100,000 jobs in manufacturing. Quite aside from the fact that these types of jobs would be temporary in nature, unlike the permanent railroad jobs which would be permanently lost, the figure itself does not bear analysis when netted against the loss of railroad equipment manufacturing jobs because of diversion of coal traffic to pipelines.

The figure of 500,000 jobs was arrived at by using the Bureau of Labor Statistics input-output methodology. Sponsors and proponents took an estimate that $12 billion would be spent on pipeline construction, determined from Department of Commerce statistics what amount would be attributable to labor costs, and divided that figure by the BLS' average wage data in the heavy construction segment of the economy.

However, it is obvious that the $12 billion will not be spent all at once. Indeed, it is likely that the sum will be spent over at least a five-year period, and that the jobs created would not cumulate. Therefore, even optimistically, all that the expenditure can promise is 100,000 jobs annually for five years. No money related to the construction of slurry lines will exist after that.

Further, using the proponents' figure of pipeline movement of 250 million tons of coal annually, the attendant contraction of coal movements by rail and its adverse effect on rail employment must be netted against pipeline construction job creation. The rail industry has estimated that the diversion to pipelines will mean that 39,000 rail equipment manufacturing jobs per year for five years will not be created. Absent pipeline construction, the railroads would invest $6.895 billion in hopper car and locomotive construction, and track improvements. This investment would yield 197,000 jobs over five years (using the BLS methodology), or 39,000 jobs annually for five years. This figure must be netted against the overall pipeline construction job figure of 100,000 annually.

In addition, the detailed rail industry analysis based upon the BLS methodology shows that only 22,000 operating jobs will exist on the pipelines over a 30-year period, while 93,000 rail operating jobs over 30 years would be created annually but for the pipelines because rail operations are inherently more labor intensive. These figures are derived by applying the BLS methodology to projected revenues for the movement of 250 million tons of coal annually, which is the amount of coal the pipelines would move annually according to slurry pipeline data. Unit train and slurry pipeline transportation of 250 million tons of coal each would yield about $3.5 billion of revenue. When the BLS methodology is applied to these revenue figures, the result is that 22,000 annual operating jobs would exist if pipelines moved the coal, while 93,000 annual operating jobs would exist if the movement was by unit trains. In short, the nation would show a net loss of 71,000 jobs for each of the next 30 years if pipelines are built.

It is clear that even assuming immediate construction of all slurry pipelines, which is most unlikely, the net effect of job creation would be definitely on the minus side.

The effects of individual coal slurry pipelines on individual railroad employment could be even more severe if such pipelines were to drive such railroads into reorganization and bankruptcy. In such cases, the employees and this Congress would be faced with future Rock Island, Milwaukee and Conrail situations.

This Committee need not be reminded of the precarious situation in which the Railroad Retirement Trust Fund finds itself. The Congress is currently seeking a means of permanently repairing the damage done by sharply declining railroad employment with the cooperation and sacrifice of the rail industry--management, employees and retirees. Any further erosion of rail employment occasioned by diversion to pipelines could doom to failure that effort and indeed any effort to save a railroad retirement system for the nation's rail employees.

The testimony and documentary evidence which have been presented to the Congress over the past nine years demonstrate conclusively that coal slurry pipelines are not needed; they are environmentally unsound; they deplete already overburdened water resources; they represent a specialized, inflexible use of energy; their construction would contradict established Congressional policy of revitalizing the nation's railroads; and, would provide private carriers the combined advantages provided private and common carriers without the attendant disadvantages of either. That testimony and evidence also demonstrate that railroads can meet the increase in demand for coal transportation at rates probably lower, but at least comparable to pipeline rates; and, that railroads are at least as energy efficient, if not more energy efficient, than pipelines.

However, if pipelines are afforded federal eminent domain authority, railroads will be placed at a disadvantage that seriously will handicap their ability to compete. The only way to avoid the destructive competition which would result from private coal slurry pipeline companies' use of eminent domain authority is to recognize now that pipelines do not offer needed or improved coal transportation, while at the same time, they would undermine the financial stability and service availability of the nation's railroads. We respectfully submit that that is too high a price to pay for an alternative system of transportation that can produce no measurable improvement over what can be provided by the existing railroad system.

In closing, I would like to refer this Committee to the detailed report issued in 1978 by the Subcommittee on Transportation and Commerce of the Committee on Interstate and Foreign Commerce following extensive hearings on H.R. 1609, one of the many predecessors of S. 801. That Report concluded: "Federal promotion of coal slurry pipelines in the manner contemplated in H.R. 1609 would undermine the national transportation policy, and, with it, the system of common carriage."

Thank you for this opportunity to present to you the views of the RLEA on this important subject.

The CHAIRMAN. Thank you very much, Mr. Kilroy.

Next we have Mr. Arthur E. Lundvall, vice president for Fossil Energy of Baltimore Gas & Electric representing EEI.

Mr. Lundvall.

STATEMENT OF ARTHUR E. LUNDVALL, JR., VICE PRESIDENT, FOSSIL ENERGY, BALTIMORE GAS & ELECTRIC CO., ON BEHALF OF THE EDISON ELECTRIC INSTITUTE

Mr. Lundvall: Thank you, Mr. Chairman.

I represent Baltimore Gas & Electric Co., as you mentioned, and I am an operator of power plants. And my plants consume about 2½ million tons of coal a year. And as a consumer of coal, I am very much interested in the absolute——

The CHAIRMAN. Can you hear in the back?

Mr. Lundvall: I am interested in the absolute lowest price of coal as it affects our customers.

In support of coal slurry pipeline development, we stress the need for maximum flexibility to promote least-cost generation. And this, of course, is in order to minimize cost to our customers, and for that reason we need the flexibility to take advantage of competition among types of fuels and among the various methods of transporting these fuels to our power plants.

As you know, coal is a critical fuel for the electric utility industry, and the electric utilities purchase nearly 700 million tons of coal a year. And approximately 56 percent of the electric generation in the United States each year is produced from coal. Coal is expected to continue to serve as an important source of electricity in the future. Thus, competition for the supply and delivery of coal is essential to transport costs—to promote cost-effective electric generation.

Because of the bulk nature of coal and the long distances over which it must often travel to reach generating plants, nearly two-thirds or approximately 460 million tons per year is transported by rail for all or part of its journey. Rail freight charges are paid entirely by utility customers and generate no profit or return for the utilities themselves.

Much of the coal transported by rail is captive to a single delivering railroad; that is, the shipper has no competitive transportation alternative.

Now, in addressing this issue, the ICC apparently relies upon hypothetical competition as its primary standard to determine if railroad rates are reasonable. Yet, it does little to stimulate actual competition among railroads that could serve captive shippers. Moreover, based on the few cases considered by the ICC to date, hypothetical competition does not seem to reduce rates to the same extent as real competition.

Under your legislation, Mr. Chairman, the States will decide if a pipeline may tap local water supply and under what conditions, thus preserving the States' ability to regulate the use of their water. The Secretary of Energy will decide which pipelines may use Federal eminent domain authority, and most importantly, the market will decide if a pipeline is economically feasible.

Development of coal slurry pipelines will produce a new element of competition in coal haulage and will provide substantial benefits for our domestic economy.

Additionally, coal transportation alternatives at competitive rates will encourage increased use of domestic coal while discouraging imports of foreign fuel. To maintain its market share, U.S. coal must have available to it the most cost-effective methods of both production and transportation. The effect of an increase in the consumption of coal will be the reduction of this Nation's dependence upon imported oil. It will create a boost to the economy and an improvement in our balance of payment in the international arena.

Electric utilities have supported coal slurry pipeline development for over 30 years, and the prepared statement makes reference to the Cleveland Electric Illuminating Co.'s pipeline to Eastlake Station built in—recognized in 1949. And the effect of the pipeline is illustrated on page 5 under table 1 where fuel rates for—delivery rates for coal for the pipeline between the period March 1957 to July 1963 remain constant at $2.47 per net ton while railroad rates during that same period decreased from $3.32 per net ton to $1.88 per net ton.

And as you can see, competition from that pipeline significantly reduced rail rates. The economic benefits of this pipeline went beyond Ohio when Consolidated Coal proposed a pipeline to Detroit Edison and New York Central Railroad cut its rate to compete. When Commonwealth Edison raised the possibility of a pipeline for coal delivery, the railroads reduced rates at two facilities. Both of these cuts matched the potential pipeline savings. The Ohio pipeline proved a point which remains true today: when faced with competition, the railroad tariffs will be reduced.

In the 1960's the California Edison Co. decided to build a coal-fired powerplant on a remote site adjacent to the Colorado River in southern Nevada. And the coal source selected was located in remote northeast Arizona, many miles from the nearest rail link. Interestingly enough, a railroad subsidiary built and currently operates the 273-mile Black Mesa pipeline. And we have already discussed that.

With the introduction of competition into the area of coal transportation, we bring substantial benefits to the customer. An excellent illustration can be found in an analysis of the introduction of a second railroad into the Powder River Basin coal fields, an area previously the exclusive domain of the Burlington Northern Railroad. And we mention here an excerpt from a report from the Bureau of Land Management of the Department of the Interior, which I won't repeat.

We recognize that slurry competition with railroads will not alleviate all of the problems of every shipper that is captive to a single railroad. Small coal shippers and captive shippers of commodities other than coal will continue to need the assurance of reasonable rates. Thus, the need for legislation such as that proposed by Consumers United for Rail Equity will remain even if coal slurry legislation is enacted.

Our industry is changing and moving on to new ways of generating electricity. Of interest to you may be the integrated gasification combined cycle process that utilizes coal to produce a gaseous fuel that will probably be used in future generating facilities. And at least one of these processes utilizes a coal slurry as the feed stock for the gasifying medium.

The changes in our industry will require greater flexibility as we seek to provide competitively priced electricity to the benefit of the Nation's economy. Development of coal slurry pipelines will inject additional transportation competition for the coal market and permit electric consumers to receive reliable electricity at the least cost possible.

Mr. Chairman, thank you very much for your attention. That concludes my testimony.

[The prepared statement of Mr. Lundvall follows:]

TESTIMONY
OF
ARTHUR E. LUNDVALL, JR.
VICE PRESIDENT,
BALTIMORE GAS AND ELECTRIC COMPANY

ON BEHALF OF
THE EDISON ELECTRIC INSTITUTE

ON
COAL SLURRY PIPELINE DEVELOPMENT

BEFORE THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

SEPTEMBER 10, 1987
WASHINGTON, D.C.

Good Morning, Mr. Chairman. My name is Arthur E. Lundvall, Jr. I am Vice President, Fossil Energy, of Baltimore Gas and Electric. I am pleased to testify today on behalf of the Edison Electric Institute (EEI) in support of coal slurry pipeline development. EEI is the association of investor-owned electric companies. Its members generate approximately 76% of all the electricity in the United States. EEI supported coal slurry legislation in 1974 and your bill (S.267), Mr. Chairman, in 1983.

Our support of coal slurry pipeline development is premised upon the need for maximum flexibility to promote least-cost generation. In order to minimize costs to our consumers, electric utilities need the flexibility to take advantage of competition among types of fuels and among the various methods of transporting these fuels to powerplants. EEI applauds this Committee for its work earlier this year on passing amendments to the Powerplant and Industrial Fuel Use Act to ensure competition among fuel types. However, much more is needed with regard to coal transportation. In that regard, we support passage of appropriate legislation which allows the development of coal slurry pipelines and amendments to the Staggers Rail Act of 1980.

Coal is a critical fuel for the electric utility industry. Electric utilities purchase nearly 700 million tons of coal per year. Approximately 56 percent of the electricity generated in the United States each year is produced from coal. Coal is expected to continue to serve as an important source of electricity in the future. Thus, competition for the supply and delivery of coal is essential to promote cost-effective electricity generation.

Because of the bulk nature of coal and the long distances over which it must often travel to reach generating plants, nearly two-thirds, or approximately 460 million tons per year, is transported by rail for all or part of its journey. Rail freight charges are paid entirely by utility customers, and generate no profit or return for the utilities themselves.

Much of the coal transported by rail is captive to a single delivering railroad, that is, the shipper has no competitive transportation alternative. Under the Interstate Commerce Act, as amended by the Staggers Rail Act of 1980, the Interstate Commerce Commission (ICC) is directed to assure that railroad rates to captive shippers are "reasonable." However, the ICC has, even in the face of severe criticism, failed to effectively implement its responsibilities. The ICC relies upon hypothetical competition as its primary standard to determine if railroad rates are reasonable, yet does little to stimulate actual competition among railroads that could serve captive shippers. Moreover, based on the few cases considered by the ICC to date, hypothetical competition does not seem to reduce rates to the same extent as real competition, at least as applied by the ICC.

A large and diverse coalition of consumers, agricultural groups, groups of regulators and consumer advocates, along with other industries have joined electric utilities in supporting the Consumer Rail Equity Act, S.676, to remedy these problems.

For the same reasons, EEI is convinced that the development of coal slurry pipelines: (1) will provide the potential of much needed competition in coal transportation; and (2) will provide a chance for a major new industry to be developed in our nation.

Mr. Chairman, under your legislation, the states will decide if a pipeline will obtain water and under what conditions, thus preserving the states' ability to regulate the use of their water. The Secretary of Energy will decide which pipelines may use federal eminent domain authority. And - most importantly - the market will decide if a pipeline is economically feasible.

Development of coal slurry pipelines will provide a new element of competition in coal haulage and will provide substantial benefits for our domestic economy. Their development is a consumer issue because pipeline transportation will offer shippers in many areas of the country an alternative, less expensive mode of coal transportation. This will reduce shipping costs and thereby lower electricity rates for consumers.

Additionally, coal transportation alternatives at competitive rates will encourage increased use of domestic coal while discouraging the importation of foreign fuel. To maintain its market share, U.S. coal must have available to it the most cost-effective methods of both production and transportation. The effect of an increase in the consumption of coal will be the reduction of this nation's dependence upon imported oil, a boost to the economy and an improvement in our balance of payment situation in the international arena.

Electric utilities have supported coal slurry pipeline development for over 30 years as a means of providing economic and efficient service to electric consumers. In 1949, Cleveland Electric Illuminating became concerned about the cost of rail coal delivery to the Eastlake Station. Studies by Consolidation Coal Company showed that a pipeline would be economic and in August of 1954 pipeline construction was authorized by Consolidation Coal. In March of 1957, the 106 mile pipeline opened. Table 1 illustrates the response of rail rates for delivery of coal to the Eastlake Station following the opening of the pipeline.

Table 1

Comparative Freight Rates, Coal Slurry Pipeline and Railroad: 1957-1963

Date	Rate (per net ton)	
	Pipeline	Railroad
March, 1957	$2.47	$3.32
October, 1957	2.47	3.37
May, 1958	2.47	3.47
May, 1959	2.47	2.77
September, 1960	2.47	2.42
December, 1960	2.47	2.49
July, 1963	2.47	1.88

Eric H. Reichl, "Some Comments on Coal Pipelines," Energy Transportation Conference, St. Louis, November, 1963.

As you can see, competition from that pipeline significantly reduced rail rates. The economic benefits of this pipeline went beyond Ohio. When Consolidation Coal proposed a pipeline to Detroit Edison, the New York Central Railroad cut its rates to compete. When Commonwealth Edison raised the possibility of a pipeline for coal delivery, railroads reduced rates to two facilities. Both of these cuts matched the potential pipeline savings. The Ohio Pipeline proved a point which remains true today: when faced with competition, railroad tariffs will be reduced.

In the 1960's, the Southern California Edison Company decided to build a coal-fired powerplant on a remote site adjacent to the

Colorado River in Southern Nevada. The coal source selected was located in remote northeast Arizona, many miles from the nearest rail link. A railroad subsidiary built and currently operates the 273 mile Black Mesa Pipeline. Electric consumers in Arizona, California, and Nevada benefitted from the selection of the most effective and economic means of transportation.

The introduction of the proposed Energy Transportation Systems, Inc. (ETSI) pipeline into the bidding process for deliveries of western coal appears to have benefitted consumers in Arkansas and Texas. Although it was eventually cancelled, the threat of competition from the proposed pipeline contributed to Arkansas Power and Light and Houston Lighting and Power being offered long-term rail transportation contracts at rates substantially below those previously paid by those utilities.

The introduction of competition into the area of coal transportation can bring substantial benefits to the consumer. An excellent illustration can be found in an analysis of the impact of the introduction of a second railroad into the Powder River Basin coal fields, an area previously the exclusive domain of the Burlington Northern Railroad. According to a July 20, 1987 Report of the Bureau of Land Management of the Department of the Interior (Summary of Findings and Conclusions):

> "Transportation rates for coal shipments in the Powder River Basin prior to 1984 were higher than rates that would result from competition.

> "Competition has led to substantial declines in rail rates in the southern Powder River Basin. Savings to consumers are estimated at over $160 million. Rate decreases are as high as $7 per ton.
>
> "Direct origin rail competition is present in some other western coal-producing regions, but most mines are served by only one railroad."

In short, competition for the delivery of coal, including competition from coal slurry pipelines, has directly resulted in lower prices to consumers. Utilities nationwide need the competition from coal slurry pipelines to serve their customers at least cost.

We recognize that slurry competition with railroads will not alleviate the problems of every shipper that is captive to a single railroad. Small coal shippers and captive shippers of commodities other than coal will continue to need the assurance of reasonable rates. Thus the need for legislation, such as that proposed by Consumers United for Rail Equity (CURE), will remain even if coal slurry legislation is enacted.

The railroad industry opposed the development of ETSI through a variety of dilatory and delaying tactics. The Burlington Northern opposed competition from the Chicago and North Western railroad into the Powder River Basin of Wyoming. The CSX and the

Norfolk Southern Railroads opposed competition from a slurry pipeline to either Baltimore or Hampton Roads. The predecessors of the Penn Central, the Pennsylvania and the New York Central, didn't want the competition from the Ohio pipeline. The entire railroad industry opposes the CURE effort. We are led to one inescapable conclusion: the railroad industry does not want any competition nor is it interested in reasonable economic regulation that protects American consumers.

Our industry is changing and moving to new ways of generating electricity, such as the integrated gasification combined cycle powerplant. Coal slurry systems provide a logical means of transportation because in most instances the coal is slurried prior to use in a gasifier. There is the potential for system economics on a site-specific basis that could occur through slurry technology.

Water is not the only medium that can be used for transport. Southwestern Public Service Company of Amarillo, Texas has been undertaking extensive efforts to develop a slurry system utilizing carbon dioxide as the transportation medium. Transporting coal by carbon dioxide is attractive to SPS because carbon dioxide occurs naturally in a geologic formation near Raton, New Mexico. SPS is hopeful to have a carbon dioxide slurry available as an alternative to consider along with other transportation alternatives to their powerplants in Texas and New Mexico.

The changes in our industry will require greater flexibility as we seek to provide competitively priced electricity to the benefit of our Nation's economy. Development of coal slurry pipelines would inject additional transportation competition for the coal market and permit electric consumers to receive reliable electricity at the least-cost possible. Mr. Chairman, we appreciate the opportunity to testify.

The CHAIRMAN. Thank you very much, Mr. Lundvall.

A May 1987 Bureau of Land Management report analyzing recently introduced competition in the Southern Powder River Basin concludes that competition has led to substantial declines, as they state, in rail rates in that area. Savings to customers are estimated at over $160 million and rate decreases as high as $7 per ton.

Do you agree with that study, first of all? Are you familiar with it and do you agree with it?

Mr. LUNDVALL. I am somewhat familiar with it. I haven't studied it in great detail, but I have discussed it with my colleagues at EEI.

The CHAIRMAN. And do you agree that the competition has led to reduction in rates of that order of magnitude?

Mr. LUNDVALL. Yes, sir, I do.

The CHAIRMAN. And would you expect that reduction in rates would come from competition with coal slurry pipelines as well?

Mr. LUNDVALL. Oh, very definitely. The CEI pipeline to Eastlake demonstrated that very clearly.

The CHAIRMAN. Are you familiar with what the railroads did with the Arkansas Power and Light when they were talking about having the coal slurry pipeline in there?

I had written my friend, Floyd Lewis, who is chairman of Midsouth Utilities to get the information on that, and he wrote me a long letter back, which I will put in the record.

But in effect, he said they had tried for years to get reasonable rates, and couldn't get anybody to talk about it. And when the coal slurry pipeline became a real possibility, then the rates fell very precipitously. And of course, they then made a contract as he pointed out in his letter, which I am going to put in the record. He said they could not reveal the inside information about the negotiations because under the contract that was to be privileged information. But the threat of that competition sure did bring down those rates.

[The Chairman's letter and the Midsouth Utilities response follow:]

J. BENNETT JOHNSTON
LOUISIANA

United States Senate
WASHINGTON, D.C. 20510

August 3, 1983

Mr. Floyd W. Lewis
Chairman/President
Middle South Utilities, Inc.
Box 61005
New Orleans, Louisiana 70161

Dear Floyd:

Thank you for your letter of the 25th in which you discussed Arkansas Power & Light's coal haulage contract with the Chicago and Northwestern Railroad. I understand your need to secure the cheapest form of transportation for your customers, and I am pleased that the prospective competition from the ETSI pipeline played a role in reducing the transportation rates of the Chicago and Northwestern.

As you know, I continue to support the development of coal pipelines, and expect that my legislation to facilitate such development will be considered by the full Senate this fall. In order to fend off arguments which opponents of this legislation might make I would appreciate it if you could answer the following questions with regard to the AP&L contract:

(1) Do these contracts provide for the transportation of minimum volumes of coal annually?

(2) Do these contracts provide that, if less than the minimum volume of coal is transported, the rate paid for the remaining coal transportation shall increase? Is there some similar provision that assures the railroad a certain minimum level of revenues?

(3) Do the contracts provide the utilities the right to renegotiate the contract if a cheaper form of transportation becomes available during the life-time of the contract?

(4) Are these contracts subject to prorationing? That is, can the contracted volumes of coal to be transported be reduced if later coal haulage demands of the railroad cannot be accommodated without such reductions?

(5) If the Chicago and Northwestern Railroad line is not developed from the Powder River Basin, must the utility still make payments to the railroad?

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Mr. Lewis
August 3, 1983

(6) If the Chicago and Northwestern Railroad line into the Powder River Basin cannot be built at the cost anticipated by the railroad, must the utility cover these increased costs either through a direct payment to the railroad or through increased rates under the terms of the contract?

(7) Does the law require that the ICC review and approve these contracts? Does the law require that the terms of the contracts are to be made public?

I believe this information will prove most useful during consideration of S. 267, and I look forward to hearing from you.

With kindest personal regards, I am

Sincerely,

Bennett

J. Bennett Johnston
United States Senator

JBJ:doq

MIDDLE SOUTH UTILITIES, INC/BOX 61005/NEW ORLEANS, LA 70161/(504) 529-5262

FLOYD W. LEWIS
CHAIRMAN/PRESIDENT

August 25, 1983

The Honorable J. Bennett Johnston
United States Senate
136 Hart Senate Office Building
Washington, D.C. 20510

Dear Bennett:

This is in response to your letter of August 3, 1983, regarding the recently contracted transportation arrangements for Arkansas Power & Light Company's coal movement to its generating plants in Arkansas.

I believe you assessed the situation accurately when you noted that the presence of a proposal from a credible slurry pipeline alternative enhanced the competitive bidding environment for this transportation. While there was additional competition between two originating rail carriers for the movement as far as Kansas City, the pipeline alternative provided the only competition to the delivering carrier from that point to the power plants.

As I have previously indicated, the Middle South System still supports the slurry pipeline concept. I want to thank you again for your continuing support for the development of coal pipelines and ask that you continue your support for the pending legislation which, hopefully, the Senate can favorably consider this fall. In my opinion, successful enactment of this legislation into law is necessary for consumers of electricity throughout the country to have the benefits of competitive pricing for transportation of coal.

In addition, your letter asked several specific questions regarding our recently signed transportation contracts. As you probably can appreciate, the railroads have insisted on stringent contract confidentiality provisions which would prevent the release of any "commercially sensitive" matters without the prior written consent of all parties to the contract. The railroads have indicated that they deem a response to your first two questions having to do with whether or not the contracts provide for minimum volume and asking if there exists some provision similar to "take-or-pay" that would assure a minimum level of revenues, to be "commercially sensitive" matters and, accordingly, the railroads refused permission for us to be responsive. Responses to the remaining five questions are detailed on the attachment hereto.

Bennett, I would point out that even if we were free to answer the first two questions, we do not believe the responses as to these specific contracts would be useful in furthering the cause of slurry pipeline eminent domain.

Perhaps, in the particular area of "take-or-pay", a somewhat different approach may be more appropriate and productive. It must be recognized that the terms and conditions of the AP&L contracts are not representative of what any given shipper can expect to negotiate, especially if he has no alternative; rather they represent what competition, particularly intermodal competition, may produce. Without pipeline competition the railroads have no incentive to negotiate a competitive contract and the utilities are stuck with the Interstate Commerce Commission tariffs. In evaluating any "take-or-pay" provisions that slurry pipelines might require, we must compare them to the published tariffs which can, particularly if present ICC philosophies prevail, only be expected to grow more onerous - both in terms of obligations on the shippers and cost to the electric consumers.

The captive utility coal shipper, absent real alternatives, cannot force the railroads to negotiate a favorable contract. Indeed, in all the prior years we have dealt with the Burlington Northern and Missouri Pacific, we could not bring them to the negotiating table with any meaningful proposals as long as they felt we had no alternatives. As a matter of fact, they have in the course of "negotiations" exhibited little reluctance to assess what we felt to be arbitrary increases whenever they considered they had the freedom to do so with impunity. For instance, the distance to the second AP&L plant which started up four years after the first one is some 7.5 percent shorter than to the first, yet when the railroads filed the tariff for this plant, they placed it at the same price as the tariff for the first plant, which we were already protesting before the ICC as being too high. Thus, the expected economies of scale of a shorter route and a doubling of the tariff tonnage moving over most of the route were denied to AP&L.

The published railroad tariffs under which the great majority of captive coal moves do have strict minimum volumes, and in a number of these, there are several tariffs in which the lower volumes have higher prices. Virtually, in all of them, there is a provision for what is called a "fall-back" rate. This rate is usually on the order of 150 percent of the base rate and the shipper, if he ships reduced amounts, would pay the lesser of the cost of shipping the entire tariff specified volume at the tariff rates (even though he did not ship that much) or pay the "fall-back" rate for the tons he did ship. In any event, the results are the same; the railroads have established a minimum level of revenues under the existing tariffs which, as I stated before, are usually the only choice captive shippers have.

The Honorable J. Bennett Johnston
August 25, 1983
Page Three

A typical tariff imposes performance obligations in the form of "take-or-pay" requirements on the shipper, but carries no reciprocal obligations of performance by the railroad.

Possibly, Bennett, there are other areas where we might be of assistance in helping you to continue your pursuit of the slurry pipeline eminent domain legislation in order that this mode of transportation can present itself as a credible competitor. If you wish, Mr. George E. White, Jr. can arrange for some of our personnel, who have been intimately involved in the railroad and pipeline situation over the years, to meet with you or your staff at your convenience. If you feel this would be desirable, just let us know.

Again, I wish to thank you for your support on this important legislation.

Very truly yours,

FWL:pdb
Attachment

Letter Sen. J. Bennett Johnston to
Floyd W. Lewis dated August 10, 1983
Responses to Questions 3 thru 7

Attachment

3. The contracts do not provide the utilities the right to renegotiate the contract if a cheaper form of transportation becomes available during the base period of the contract, nor is the railroad afforded any renegotiation rights.

4. These contracts are not subject to pro-rationing.

5. If the Chicago and North Western Railroad line is not developed from the Powder River Basin, the utility has no obligation to make any payments to the railroad.

6. If the Chicago and North Western Railroad line into the Powder River Basin cannot be built at the cost anticipated by the railroad, the utility has no obligation to cover any increased cost through either a direct payment to the railroad or increased rates under the terms of the contract.

7. The law does require that the ICC review and approve these contracts. It is our understanding from the railroad that these contracts were filed with ICC on July 22, 1983. It is, further, our understanding of the law that ICC is required to retain the terms of the contracts confidentially.

The CHAIRMAN. And EEI would expect that anywhere you had the threat of competition, whether by another railroad or by a coal slurry pipeline. Isn't that true?

Mr. LUNDVALL. That's the gist of my testimony, yes, sir.

The CHAIRMAN. It seems to me that it may be certainly in the interest of the coal industry, certainly in the interest of coal users, and I would think not to the detriment of railroads if we could utilize this vast coal resource we have in this country. Right now you are not utilizing it in my judgment because it is really not competitive. I mean, you can bring in coal from Australia and Colombia and all over the world to compete with American coal.

People are not buying coal-fired units, and they are not likely to. They are not buying nuclear units, but they are also not buying coal-fired units. Of course, they are not buying any units now. We have somewhat of a surfeit of electric generating capacity around the country. But when they get ready to buy units, I don't know that they are going to buy all these coal units unless we can demonstrate that they are going to be competitive.

And I think that to the extent that we could get rates down so that you could get coal costs down, we might begin then really to utilize that vast coal resource. And by getting the railroad rates down, I think you could participate in that increased usage of coal.

On a short-term basis, I am sure it is impossible to convince the railroads of that because, you know, you say reduce rates and things are going to be better. Well, what happens in the meantime when your profits are eroded?

But it seems to me that competition would be very much in the interest of the consumer, the coal industry, and I would hope not to the detriment of railroads.

Would you think that would be true? Do you think if railroads would necessarily be hurt by this thing?

Mr. LUNDVALL. Well, I listened to the previous testimony. And I have been receiving coal at my plants by rail for many years. And we have at least one plant that has no competition for delivery schedules. And we spend more money at that particular plant for coal than we do at the others—for transportation rates than we do at the other plants where we have alternate sources.

One source—we ship coal all the way to Norfolk, Virginia, transship it on barges and bring it up to Baltimore in order to get a better rate than we can get by coming directly into Baltimore with the coal, which doesn't seem sensible, but nevertheless, that's what we had to do to minimize our rates.

However, a year ago we concluded an unsuccessful attempt to obtain eminent domain legislation in the State of Maryland with the thought of building a coal pipeline from the western part of the State of Maryland into the Port of Baltimore possibly. And the process would have been to utilize that coal slurry to operate our plants and also to ship coal either to other east coast ports or overseas. It never came to pass, and that is one of the reasons why we are back here today in an attempt to—well, in support of your legislation.

The CHAIRMAN. Thank you.

Let me say in concluding, Mr. Kilroy, I very much realize and concur with the need for a strong railroad industry in this country, notwithstanding maybe overly flippant remarks today. We really believe that in this committee. All of us do. And we would not want to do anything that would erode the basis for a healthy and viable railroad industry.

And I think notwithstanding only a 3 percent increase in revenues, or whatever that figure was that Mr. Dempsey said since 1980, all of industry has been suffering since that time.

We hope we will come out of that slump. We are beginning to somewhat in agriculture, at least in some sectors of agriculture. We are beginning to, we hope, in the petroleum industry.

But we recognize the need for a strong railroad industry. And believe me, if I thought this bill would seriously erode the railroad industry, I would not be for it. I just believe that competition would be good for the country and not necessarily harmful to the railroad industry. Maybe short-term profits—I mean, for example, maybe the threat of competition for Arkansas Power & Light eroded some of those profits which otherwise I believe would have been excessive. But I think the railroad industry can accommodate to that competition and can, in effect, be competitive. And I think this bill would, as I say, be in the national interest.

Senator Wallop?

Senator WALLOP. Were you about to respond, Mr. Kilroy?

Mr. KILROY. Yes, Mr. Chairman, if I just might.

What competition has done to the railroad industry is to reduce jobs and reduce track and reduce even wages and benefits in some areas. So, it is pretty hard for me to get onto the bandwagon of being for competition.

Fair competition I guess is a better word, but when competition—if it is coming from—if coal is coming from nations in South Africa or other places where they are paying coal miners slave wages or they are practically slaves, then United Mine Workers in this country could not compete with that. United Mine Workers are just as much opposed to this bill as the RLEA, and I think will so advise the committee.

Senator WALLOP. I know that rail transportation rates have been a significant factor in the constraint of the development of Wyoming coal captive shippers' problems—really pretty widespread in my State.

You know, you have a kind of a balancing act to try to figure out whose interests are supreme. And what you try to do is to try to find some balance that doesn't make one supreme over the other. But we do have the potential for a large loss of jobs in the Wyoming mining industry because of a lack of ability to deliver coal to consumers.

I noticed in your statement you said, "It is our conviction that the passage of such legislation in these times would not be in the public interest generally." Can you envision the time when it would be?

Mr. KILROY. Well, I don't know. I guess a lot is involved as to what are you going to do with all this coal, even if you had coal slurry pipelines, if you are not able to burn it because of environmental problems. Or if there is another form of generation that is cheaper, then what are you going to do with all this coal? So, I don't see that there is any more need for a coal slurry pipeline today than it was 5 years ago, 3 years ago, or 10 years ago.

The railroads are capable of hauling all the coal that can be produced. They can haul all that they have. They have the capacity to haul every ton of coal that can be produced out there. It is just a question I guess that there is not the market for it. Whatever market there is, they are meeting.

Senator **Wallop**. Well, but the market is created by the delivered cost of coal, not the mines' cost of coal.

Mr. **Kilroy**. Well, there are mine costs, and there are user cost.

Senator **Wallop**. Yes, but I mean, you are talking about saving jobs and in that instance losing jobs more or less uniformly. You are losing railroad jobs because the coal cannot be delivered at a competitive cost to imported oil. It would seem to me that there is a judgment that has to be made.

My particular concern in all of this has been the protection of the right of the State to allocate a water supply within that State to such a purpose. Near as I can tell, this protection is about as complete as it could be devised within this legislation.

Then comes—I'm trying to find out what the role of the Government is. Is it to prevent the competition? You say unfair competition, but is this unfair competition?

Mr. **Dempsey**. Could I address that question, Senator?

Senator **Wallop**. Please.

Mr. **Dempsey**. The problem with this kind of competition is that there is no way to make a coal slurry pipeline——

Senator **Wallop**. No way to? Excuse me?

Mr. **Dempsey**. There is no way to make by law a common carrier out of a coal slurry pipeline. The railroads, on the other hand, are common carriers. Now, that means that we have to serve anybody that has a line.

Now, if the Congress were to say, well, all right, then let us make the competition fair and we are going to abolish all existing laws regulating the disposition by railroads of their capital so that we can abandon lines that are marginally profitable. We can restructure the whole industry. We can become as much as we want, like a coal slurry pipeline concentrating only on high volume, relatively high profit commodities. That's a different matter.

But the Congress won't do that, and I wouldn't suggest they should do that. And so, that is the element of unfairness in it, and there is nothing that the coal slurry pipeline advocates—it is not their fault. It is just the inherent economic and physical nature of this kind of an operation.

Senator **Wallop**. But then would you suggest that we would abandon oil pipelines for the same reason because they are not common carriers? They are high volume carriers of a single purpose, a single product.

Mr. **Dempsey**. Now, the question is not whether anyone should abandon anything. I was simply responding to your question as to what was unfair about the competition.

This competition can be made fair, but you would have to restructure the rail industry or permit the rail industry to restructure itself.

Senator **Wallop**. But the interesting thing is that the rail industry has risen to meet those demands and been able to divert planned constructions of slurry pipelines.

Mr. **Dempsey**. I'm sorry?

Senator **Wallop**. Well, the rail industry has been able to meet the demands of competition and has been able to divert the construction of slurry pipelines simply by creating an economic environment in advance of that heavy capital investment. The rail industry has been doing a pretty good job of diverting these things without the power of eminent domain. Each time they have arrived at a place of economic viability, the railroads have managed to meet what would be the delivered price.

Mr. **Dempsey**. Of coal slurry pipelines?

Senator **Wallop**. Yes.

Mr. **Dempsey**. Well, there is only one instance of which I know that I have any familiarity with, and that is the Arkansas Power & Light case. I expect there are others, but that is the only one that I know about.

There are two railroads involved there, incidentally, as well as the pipeline. And that, of course, arose because of the opening of the Powder River Basin to competition between the Burlington Northern and the Northwestern and——

Senator **Wallop**. Well, how does it make sense for Mr. Lundvall's company to ship to a barge and move it around and avoid all the railroads involved? How does that save jobs in the railroad industry?

Mr. **Dempsey**. I am sorry. I am not familiar with that particular instance. I'll be glad to look into it and give you a comment on it. I just can't comment on that.

[Subsequent to the hearing Mr. Dempsey submitted the following:]

ASSOCIATION OF AMERICAN RAILROADS

William H. Dempsey
President

October 19, 1987

The Honorable J. Bennett Johnston
Chairman
Committee on Energy and Natural Resources
364 Dirksen Office Building
Washington, D.C. 20510

Dear Mr. Chairman:

At the coal slurry hearings you held in September, a representative of Baltimore Gas & Electric (BG&E) noted that it has shipped coal on barges from Norfolk, Virginia, rather than transport the coal by rail into Baltimore. The BG&E representative stated that shipping coal from Norfolk didn't "seem sensible, but nevertheless, that's what we had to do to minimize our rates." Senator Wallop asked me to comment on the BG&E coal shipments, and I stated that I would look into the situation and comment later.

It turns out that there is a very good reason why all of BG&E's coal deliveries to the plants in question, the Wagner and Brandon Shores plants, are by barge--namely, although these plants are served by rail, they do not have the facilities to unload coal from rail cars on a regular basis. Coal is shipped via Conrail or CSX through the Port of Baltimore, or via CSX or Norfolk Southern (NS) through Hampton Roads, and then transloaded into barges for delivery to the plants. Thus, BG&E can obtain coal from three competing mining regions via three competing railroads, two competing ports and numerous competing barge lines. By no stretch of the imagination can it claim to be captive to a railroad.

In the past, BG&E has in fact utilized Conrail and CSX through Baltimore, and NS and CSX through Hampton Roads. BG&E has just signed a contract with CSX under which CSX will transport almost all of the coal for these two plants. Interestingly, the contract permits BG&E to utilize either Baltimore or Hampton Roads, thus enabling BG&E to select its sources for coal on the basis of coal quality, market conditions, and transportation rates. There can be no better evidence that BG&E is enjoying the benefits of thriving competition both as to coal sources and carriers.

If there is any additional information you or Senator Wallop need, please let me know. It was a pleasure to be afforded the opportunity to testify before your Committee.

Sincerely,

W. H. Dempsey

cc: Senator Wallop

50 F Street, N.W., Washington, D.C. 20001 (202) 639-2402

Mr. **Dempsey**. In terms of, however, questions of importing foreign coal, those instances are sporadic and amount to something like 10 percent of the coal that we export. We are still the number two exporting coal country in the world. So, it seems to me that that is rather a point not well taken.

So far as the West is concerned, Senator, I would mention that the report that was referred to by the chairman by the Bureau of Land Management says that now that the Powder River Basin has been opened up to competition, and it says taking that in conjunction with the Department of Justice report, which says that carriers are not exercising market power in any other coal producing regions, the problem of competition is not a significant one anymore.

Now, of course, you are correct in saying that in some areas, and not only in the West but in other parts of the country, railroads do have significant market power. But as the Bureau's report points out, the competition that has now been extended from the Powder River Basin to all other consuming points constrains the rates that are able to be charged by the railroads in areas in which otherwise they would have market power.

Senator **Wallop**. Well, I must say a bureaucrat's view of competition is somewhat different than the competitor's view of competition. I still hear significant comments from Wyoming coal producers.

Mr. **Dempsey**. Well, yes. Everyone wants a lower price. Railroads want to make as much profit as they can. The shippers want to have the lowest rate that they can. I understand all of that. That's the way that the business operates.

Now, it seems almost un-American to oppose full and free competition. But I will simply—and without arguing the point in terms of principle, I will simply state the fact. And the fact is that if the railroads are to be forced by law to operate like supermarkets, then something has to be done to rid us of all regulatory shackles because what we need then is a major reconfiguration of the system. It has got to be a core system concentrating on high volume, relatively high profit commodities. I mean, those are the economic facts, and those really are the fundamental choices.

Senator **Wallop**. Mr. Lema?

Mr. **Lema**. Senator Wallop, the coal industry believes that coal transportation competition is desirable, necessary, to keep the delivered price of coal down. And we believe that the legislation in question, S. 801, provides adequately for meeting common carrier obligations from the standpoint of holding out an opportunity for all coal shippers in the certification process of the pipeline if they are ready, fit and able to enter into the pipeline to be incorporated into that pipeline design. We think that meets the common carrier obligation.

Senator **Wallop**. Thank you. Thank you all very much. I appreciate your taking time to come here this morning.

The last panel is Mr. R. M. Braca, president of Snamprogetti, and Mr. Edward W. Clyde, attorney. Thank you, gentlemen, and welcome, Mr. Braca.

STATEMENT OF R.M. BRACA, PRESIDENT, SNAMPROGETTI USA, INC.

Mr. Braca. Mr. Chairman and members of the committee, my name is Mike Braca. I am president of Snamprogetti USA. Our parent company, Snamprogetti in Milan, Italy, is the research and engineering company of the Italian energy group, ENI.

I would also like to explain that I am a native born U.S. citizen. I am a chemical engineer educated at Cooper Union and New York University. I am a professional engineer in the State of New York.

I am pleased to be able to tell you of our group's activities in coal-water fuels and coal pipelines. Snamprogetti is a member of the Slurry Technology Association and is participating with the U.S. Department of Energy and the United States-Italy Cooperative Project on coal-water mixtures.

We may ask why should a coal importing country be so interested in new coal technologies. With rapidly rising oil prices in the 1970's, a fourfold increase of coal imports into Italy was anticipated which would give rise to a variety of logistical and technical problems.

A solution was proposed to convert the coal into a coal-water fuel which could do three things. It could utilize much of the existing facilities being used for fuel oil, minimize the cost and space requirements of converting power plants from oil to coal, and permit the firing of oil of coal-water fuel interchangeably.

With this concept in mind, our engineers developed and tested a proprietary coal-water technology, REOCARB, which is what we call it, which was successfully demonstrated on our full-scale test facilities in Italy. The coal-water fuel had a typical composition of 70 percent coal, 29 and a half percent water, and a half of a percent dispersants. It was quite stable in storage and is transportable as fuel oil.

Coal-water fuels produced from a wide variety of coals have undergone extensive combustion tests in the USA and in Europe.

Please note that coal-water fuel uses less than half the quantity of water compared with conventional coal-water slurry as practiced at Black Mesa in Arizona.

Furthermore, coal-water fuel is burned in the form it is transported and does not need dewatering or water cleanup.

With this technology, Snamprogetti constructed two 100,000 ton per year coal-water fuel plants in Italy which went into operation in 1985 and 1986. Other plants are now being designed for Italian locations with capacities up to 500,000 metric tons per year.

A larger rail car plant with an associated pipeline facility is now being constructed as a prototype coal-water fuel project in Siberia. When completed in 1988, it will have a capacity of 4½ million metric tons per year of coal-water fuel containing 3 million tons of dry coal. The product will be pumped from the Belovo mines via a 20 inch diameter underground pipeline, 160 miles to Novosibirsk, and burned in a powerplant there without dewatering.

The U.S.S.R. plans to transport even larger quantities of coal and lignite from Siberia to the industrial areas of the western country there.

Snamprogetti and the U.S.S.R. ministry are conducting a joint study to determine the feasibility of twin pipelines each 2,000 miles to transport a total of 33 million metric tons of coal per year from the Kuzbass coal mines to the Ural industrial areas. One line would carry coal-water mixtures for energy use, and the other for the production of metallurgical coke.

Elsewhere we are studying the applicability of coal-water fuel pipeline systems for developing countries such as China and India where there are extensive indigenous coal reserves and inadequate rail and road systems.

Industrialized countries, and particularly the United States, are confronted with a growing dilemma: an increasing use of coal is the main source of energy in the long term, and widespread concerns with the environmental problems caused by coal combustion. Environmentally a more acceptable system overall to feed power plants and other fired equipment would use coal-water fuel rather than dry coal.

We can visualize the coal-water fuel concept growing into an overall scenario as follows. Large-scale coal-water fuel production plants incorporating advanced coal beneficiation would be located mainly at or near mine sites. Tankards facilities for coal-water fuel storage at distribution centers in industrial areas would be completely nonhazardous and nonpolluting. Coal-water fuel products would be transported to storage centers and to end users by the same means as fuel oil. Pipeline networks would provide in many situations the most economical means of transportation.

And I should add that a pipeline minimum size would carry about 1 to 3 million tons. Below that they would certainly use the other means of transportation.

The many end uses of coal-water fuel products would include in the future powerplants of all types, industrial boilers and kilns, coal gasifiers for chemical plant feed stocks, cogeneration systems, metallurgical plants, stationary and marine diesel engines.

Eventually mobile diesel engines for heavy road vehicles and railroad engines would use a highly beneficiated coal-water fuel based on micronized coal. This specialized technology is currently under development by several groups in the United States and abroad in some cases under the sponsorship of the U.S. Department of Energy.

In summary, this promising industrial concept of using coal-water fuel as a clean, broad-based energy source is ready for commercialization. It's full potential in the USA can be realized, however, only when the eminent domain legislation provides the rights-of-way to coal pipelines for the optimum implementation of this emerging clean coal technology in order for it to compete with fuel oil on equivalent terms.

Thank you.

[The prepared statement and a subsequent submittal from Mr. Braca follows:]

Statement of

R.M. Braca, P.E.
President
Snamprogetti USA Inc.
666 Fifth Avenue
New York, N.Y. 10103

Prepared for

Committee on Energy and Natural Resources
Hearing on S. 801
"The Coal Distribution and Utilization Act of 1987"
September 10, 1987

U.S. Senate
Washington, D.C.

Mr. Chairman and members of the Committee, I am Mike Braca, the President of Snamprogetti USA Inc. of New York, representing on the North American market Snamprogetti S.p.A. of Milan, Italy, a research and engineering company within the Italian energy group, ENI. I am pleased to have the opportunity today to tell you about our group's activities in the fields of coal-water fuels and related coal pipelines where we are heavily engaged in and committed to the development of the relevant technologies and their commercial applications. As part of this commitment, Snamprogetti has been a long-standing member of the Coal and Slurry Technology Association based in Washington, D.C. and is participating in the U.S.-Italy Cooperative Project on Coal-Water Mixtures. The project is conducted under the provisions of Annex I to the "Memorandum of Understanding between the Government of the United States of America and the Italian Republic concerning Energy Research and Development Cooperation", signed in Rome on December 5, 1985. This memorandum is a continuation of an earlier memorandum between the two governments, concerning energy cooperation, that was signed on October 17, 1979.

It may be interesting to note why a coal-importing country should have become so interested in developing new coal technologies. In the face of rapidly rising oil prices in the 1970's, it was anticipated that there would be a fourfold increase of coal imports into Italy, which would soon strain the existing infrastructure's capacity to receive, transport inland and store the additional amounts of coal that would be consumed by the industrial and utility sectors. There was the additional problem at the end of the coal supply chain, of converting a large number of boilers and furnaces from oil- to coal-firing.

After many studies, the solution proposed to these potential problems was to convert the coal into coal-water fuel (CWF), which could utilize much of the existing pipeline and storage facilities currently being used for fuel oil. This would also minimize the cost and space requirements of converting power plant boilers and other fired equipment from oil to coal and permit the firing of oil or CWF interchangeably as alternative fuels.

With this concept in mind, our engineers proceeded with the development and testing of a coal-water slurry technology, later designated as REOCARB, whose CWF product would meet several major criteria:

1. It should be directly combustible as a liquid fuel, with a high coal concentration, in the order of 65 to 75% dry coal content, and a proper particle size distribution to ensure good atomization at the burners and a high combustion efficiency;

2. It should be stable so that it can be stored in tankage for long periods and be shipped in tank trucks, rail tank cars and barges without the coal settling out;

3. It should be transportable in pipelines over long distances, with reasonable pumping costs and without the risk of plugging the system during flow interruptions; and

4. The total cost of CWF production and transportation to the end user should be competitive with alternative fuel systems involving dry coal or fuel oil.

It should be noted that the "concentrated" coal-water slurry or CWF concept differs somewhat from the "conventional" coal-water slurry technology as currently practised in Arizona with the Black Mesa coal pipeline. The latter system operates on the principle of transporting and delivering a lower concentration slurry, typically 50% coal and 50% water, that requires at the pipeline's destination a "dewatering" step, i.e., a separation of excess water. This then involves the further steps of water cleanup and disposal and a final grinding of the dried coal to reach the particle size specification for pulverized coal (which is today the most common form of fired coal for large power plants). All of these steps can be avoided at the destination when transporting CWF or "concentrated" slurry, with the added advantages that preparing and transporting the CWF requires less than half the amounts of water and of pumping power as does the "conventional" slurry.

The results of Snamprogetti's R&D work with the CWF concept were successfully demonstrated on the pilot plant and full scale, closed-loop pump and pipeline facilities at Fano in Italy. The Reocarb CWF produced and tested had a typical composition of 70% coal, 29.5% water and 0.5% dispersant chemicals. The product was completely stable in storage for periods of more than one month without the use of re-mixing devices. Tests also showed that commercially available pumping equipment can be used for CWF pipeline systems. Quantities of CWF produced from a wide variety of internationally traded coals have been shipped from Fano and used in combustion tests conducted at test facilities in the USA (Combustion Engineering and Babcock & Wilcox), the United Kingdom (Peabody-Holmes), Austria (Dumag), and Italy (ENEL and ENICHEM).

With this background, Snamprogetti undertook the design and construction of two 100,000 metric tons/year CWF production plants in Italy, at Livorno (Leghorn) and Porto Torres, Sardinia. These plants have been in commercial operation since 1985/86. The Livorno plant supplies CWF to the local industrial sector and Porto Torres supplies a 300 tons/hr. steam boiler on site. Other CWF plants are being designed for Italian locations, with capacities up to 500,000 metric tons/yr.

A notable event for the CWF technology was the award to Snamprogetti of the design and supply of a Reocarb plant and pipeline facility for the U.S.S.R.'s commercial prototype CWF project in Siberia. When completed in 1988, it will have a capacity of ca. 4,500,000 metric tons/year of coal-water fuel which will contain 3,000,000 metric tons of dry coal. The production plant is located at the mine site area of Belovo. The CWF product will be pumped through a 20" diameter underground pipeline over a distance of 160 miles, stored in tankage at the utility's site in Novosibirsk and burned in selected power plant boilers there. The extreme winter conditions at the project sites made it imperative not only to bury the pipe below the frost line but also to use a concentrated coal-water slurry fuel which does not require dewatering facilities and settling ponds at the pipeline's destination.

More detailed information on the Italian and U.S.S.R. projects can be found in D. Ercolani's technical paper which is included as an attachment hereto.

It has been well reported in the press that the ultimate aim of the U.S.S.R. is to transport coal and lignite from sparsely settled Siberia to the industrial areas west of the Ural Mountains. A number of international companies have had discussions with the U.S.S.R. on performing studies for such coal pipelines covering distances of 1500 to 2500 miles. One of these studies has already been initiated jointly by Snamprogetti and the U.S.S.R.'s Ministry of Construction for the Oil and Gas Industry. This study will determine the technical and economic feasibility of a twin pipeline system to transport coal-water slurries from the Kuzbass coal mines in Siberia to industrialized areas in the Urals. Each pipeline would be 2000 miles long and the dual system would have a total capacity of transporting 33,000,000 metric tons of coal per year. One line would carry slurry for energy use and the other for the production of metallurgical coke for the steel industries.

For other geographical areas and particularly the developing world, Snamprogetti is studying the feasibility and applicability of developing coal pipeline systems in situations such as China's and India's where there are extensive indigenous coal reserves, limited infrastructure and inadequate rail and road transportation systems. The use of coal-water fuels and dedicated pipeline networks represents an attractive lower cost solution for those countries. Earlier this year, we made a presentation on this approach to World Bank representatives here in Washington, D.C.

In the highly industrialized countries and particularly the U.S.A., we are confronted with a growing dilemma as we plan our future energy needs into the next century. On the one hand, it is clear for a complex of reasons that there will almost inevitably be an increasing use of coal as the main source of energy in the long term; but on the other hand, this trend has given rise to widespread concerns with the problems of environmental pollution and acid rain caused by the combustion of coal on an even larger scale than now.

Several of the proposed solutions to the environmental problems with coal combustion involve the use of coal gasification and fluidized bed combustion equipment which in many cases must be fired with ground coal, usually as a finely powdered or pulverized material. The processing, movement and storage of dry, pulverized coal incurs the multiple risks of spontaneous combustion, which can cause serious fires and explosions, and of contaminating the surrounding areas with coal dust. It must therefore be produced, stored and transported in air-free, sealed systems. For these reasons, the coal is often ground at the site of each power plant and industrial boiler in order to minimize the problems of handling the pulverized coal before it is burned.

A cleaner and more environmentally acceptable system overall to feed power plant boilers, gasifiers and fluidized bed combustors would be based on using coal-water fuel which would have a number of decided advantages in addressing the various problems we have been trying to solve. With this approach, we can foresee a broad, new concept for the processing, marketing and combustion of coal which draws many parallels to the more highly developed worldwide networks of petroleum refining, distribution and consumption. A coal-water fuel quickly and economically transforms dry coal from a bulky and cumbersome material to handle, store, transport and burn, into a liquid which is by far the preferred form of fuel due to its ease of handling and its high energy content for the space it occupies. The U.S. government has in the past supported many synfuel development projects whose primary aim is to convert coal into liquid and gaseous hydrocarbon fuels. This is extremely expensive and may be justified in the future to make liquid fuels for automotive vehicles. For heavy fuel applications, however, it makes more economic sense to replace fuel oil with coal-water fuels which can be made at a fraction of the cost of liquid hydrocarbons from coal.

The question then arises of the ash and sulfur content of the coal in the CWF product. The preparation of CWF involves the grinding of coal to extremely fine particle sizes, which coincidentally makes the coal more susceptible to being beneficiated. The beneficiation process reduces the ash and sulfur content to a greater degree than that which can be accomplished with beneficiation of the coarse coal at the mine head. Grinding plants to make pulverized coal at power plant sites do not normally include beneficiation steps because these invariably introduce water to the coal mix which would then have to be dried before firing as pulverized coal. Furthermore, electric utilities are extremely reluctant to get involved in beneficiation and in providing the considerable physical plot areas adjacent to their power plants that would be needed for such equipment and processes.

With these thoughts in mind, we can visualize the CWF concept germinating and growing into an overall scenario with a series of commercial developments taking place, as follows:

1. Large scale CWF production plants would be located mainly at or near mine sites where such plants could process the rejected coal fines as well as the run-of-the-mine coal to whatever levels of ash and sulfur that can be achieved with the appropriate beneficiation technologies currently available.

2. CWF products would be made in various grades that would be oriented to the intended end user. For example, boilers designed for oil firing would require a lower ash CWF than equipment designed for coal-firing. Large diesel engines would require a CWF with an even lower ash and a finer coal particle size. Fluidized bed combustors are designed to accept un-beneficiated coals and the preparation of CWF for FBC use would probably exclude a beneficiation step and the attendant costs.

3. Tankage facilities for CWF storage would be provided at the CWF production plant sites and at distribution centers in industrial areas. Such storage would be completely non-hazardous, non-volatile and non-flammable compared with the storage of petroleum products.

4. Shipment of CWF products, depending on the quantities and routes, would be accomplished by several alternative means: rail tank cars, tank trucks, river barges, coastal vessels, and ocean carriers.

5. For continuous movement overland of larger quantities of CWF, pipeline networks would provide in many situations the most economical means of transportation, except perhaps where navigable rivers are conveniently available along an intended route. In particular, pipelines would be most appropriate for CWF transport from the coal mine areas to major storage/distribution centers and direct to large power plants and industrial consumers.

6. The potential end users of CWF products fall into many categories, which would include but not be limited to:

    - Power plant boilers
    - Industrial boilers and furnaces
    - Fluidized bed combustors
    - Gas turbines
    - Coal gasifiers for power generation
    - Co-generation systems of various types
    - Coal gasifiers for chemical plant feedstocks
    - Cement kilns
    - Metallurgical plants
    - Stationary and marine diesel engines.

Eventually, larger mobile diesel engines for heavy mining equipment, road vehicles and railroad engines will be able to use a highly beneficiated CWF based on micronized coal. This specialized technology is currently under development by several groups in the USA and abroad, in some cases under sponsorship of the U.S. Department of Energy.

In summary, this new and promising industrial concept of using coal-water fuel as a clean, broad-based energy source is ready for commercialization, but its full potential in the U.S.A. can be realized only when the enabling "eminent domain" legislation is passed by the U.S. Congress to provide the rights-of-way for coal pipelines, which are an integral and necessary prerequisite for the optimum implementation of this emerging technology.

I thank you for the opportunity to appear before you today, and I hope that the information I have provided will be helpful to the Committee's deliberations on the proposed legislation.

* * *

Attachment: Snamprogetti technical paper, "Production Plants and Pipeline Systems for Snamprogetti's Coal Water Slurry: Recent Experience and Current Projects in Italy and the U.S.S.R.", presented by Ing. Dario Ercolani at the Eleventh International Conference on Slurry Technology, March 16-18, 1986, Hilton Head, South Carolina.

* * *

PROCEEDINGS
OF THE

ELEVENTH INTERNATIONAL CONFERENCE ON SLURRY TECHNOLOGY

March 16–18, 1986
Hilton Head, South Carolina
U.S.A.

PRODUCTION PLANTS AND PIPELINE SYSTEMS FOR SNAMPROGETTI'S COAL WATER SLURRY: RECENT EXPERIENCE AND CURRENT PROJECTS IN ITALY AND THE U.S.S.R.

D. Ercolani

Snamprogetti S.p.A.

Italy

INTRODUCTION

The full name of the USSR project is "Pilot-Commercial Coal Slurry Pipeline, Belovo-Novosibirsk, and Slurry Preparation Complex." This rather lengthy name describes the comprehensive nature of the project. The contract was awarded to Snamprogetti by Techmashimport of the USSR in August 1985, after several months of negotiation, as a result of advances made by Snamprogetti in the research and development of coal-water mixtures. Snamprogetti developed its own technology with the following objectives:

—to produce an alternative fuel to heavy fuel oils

—to develop an alternate mode of handling, transporting, storing and burning coal. These objectives applied as well to this project. In fact, the Belovo-Novosibirsk slurry system represents the first industrial application of the comprehensive coal-water mixture (CWM) technology in the world: an integrated system for the production, transportation by pipeline, and direct combustion of CWM in a thermal power station, without dewatering or any other treatment of the coal before combustion.

The technical aspects of the transport of CWM by pipeline, in particular, had to be addressed. Slurry production plants smaller than the Belovo plant are presently producing slurry fuels for pilot or industrial boilers in Italy and in other countries: so there is already a certain experience in slurry production and combustion. But this project represents the first use of technology for the transportation of CWM by pipeline. The location of the USSR project is southwestern Siberia, an enormous area with many mineral resources, mainly coal, but very far from utilization areas. This is an ideal situation for the application of slurry pipeline technology, which was developed as the most suitable means of linking coal mines to end users.

The slurry production plant will be built near the city of Belovo, in the center of the coal fields of the Kuzbass region; the coal-water mixtures will be piped to a giant power station at Novosibirsk.

The main features of the project are the following:

- the capacity of the slurry production is 3 million metric tons/yr of dry coal
- the slurry will be produced using a complete wet process, the REOCARB process, developed by Snamprogetti
- the pipeline will have a diameter of 20 in. and a length of 256 km
- three pumping stations are required to give the necessary boost to the design throughout
- the thermal power station at Novosibirsk, originally designed for coal-firing, consists of 6 units, 220 MW/each.

As the name indicates, this integrated slurry system is defined as both pilot and commercial:

- the plant is considered commercial or industrial in terms of size, capacity, and the continuous service which must be assured
- It is also a pilot plant, since it will be used as a huge test facility to check the performance of important types of equipment for use in future projects involving larger slurry pipeline systems.

This specific requirement was one of the design criteria during the basic design of the plant. The project will be built in joint cooperation between Soviet organizations and Snamprogetti, which will supply license and know-how, basic design, and the main equipment for the slurry production plant, pumping stations, pipeline terminal and the combustion system. With regard to the schedule of the project, the basic and detailed designs will be completed in 1986. Delivery of the main equipment and civil work will be completed by 1987. The erection of the plants and the commissioning of the Belovo-Novosibirsk coal slurry pipeline system are planned for completion by 1988.

THE TECHNICAL BACKGROUND OF THE USSR PROJECT

In the early seventies, Snamprogetti started the R & D activities on two-phase solid-liquid flow to develop its own technology for the hydraulic transportation of solids by pipeline. Extended experimental work was done in the test facilities at Snamprogetti's Pipeline Engineer Center in Fano, Italy. Many tests were carried out on slurries with different minerals as solid phase (iron ore, phosphates, sands), but most of the work was done on the hydraulic transport of coal as dilute slurry (50/50). In 1980, the R & D activity on high concentration coal-water mixtures began, with particular emphasis on overcoming the limitations on existing pipeline transport technology, namely:

- the need to maintain pipeline flow above the minimum operating velocity because of the settling behaviour of the dilute slurries
- the need for coal dewatering at the pipeline terminal
- the need for water treatment or its disposal after dewatering
- the need for further size reduction of the coal before combustion.

These R & D objectives were reached in three steps. Work on a laboratory scale was the first step. Different types of coal were analyzed for their characteristics, and different types of chemicals (both fluidizing and stabilizing agents) were tested to evaluate their performance. Studies were carried out to optimize the grain size distribution of the coal in the slurry, and bimodal grain size distribution was found to produce the optimum curve for the preparation of concentrated slurries. Bimodal distribution produces the best results in terms of mixture concentration, fluidity, and stability, which in most cases can be obtained without the use of stabilizing additives.

The second step was performed on a pilot plant scale: a slurry production plant with a capacity of 250 kg/h was set up to check different process solutions and to demonstrate the reliability of the Snamprogetti process based on the bimodal grain size distribution curve concept. At the same time, extended pumping tests in 4- to 10-inch diameter pipes were performed to study the rheology of the mixture in pipe flow, to measure friction losses, and to check the reliability of the correlations used in predicting losses. This second experimental activity concluded with combustion tests to evaluate the combustion properties of the coal-water mixtures and to obtain useful feedback to improve their overall characteristics.

The final result of this research phase was the definition of the REOCARB process for preparing coal-water mixtures which are fluid, stable and pumpable over long distances. The third important step for the development of the Snamprogetti's technology was the design and construction of demonstrative and industrial slurry production plants (Table 1).

In 1984, the first Italian REOCARB production plant was awarded to Snamprogetti by Industrie Chimiche C. Laviosa. This plant at Livorno has a design capacity of 100,000 tons/year of slurry and has been in operation since March 1985. In 1984/85 another Italian plant designed by Snamprogetti was completed, a pilot plant in the petrochemical complex of Enichem-Anic at Porto Torres, in Sardinia. The nominal capacity of this plant is 100,000 t/y of slurry. It began operation in December, 1985, with the production of REOCARB mixtures prepared from petroleum coke. This plant simulates almost entirely the process scheme adopted for the slurry plant at Belovo.

Almost simultaneously with the Russian project, another important contract was awarded to Snamprogetti by Enichem-Anic. The pilot plant at Porto Torres is to be followed by a larger slurry production plant whose basic design is presently under way at Snamprogetti. This plant will have a design capacity of 500,000 t/y of petroleum coke-water slurry or coal-water slurry; construction is scheduled for 1986/87, and the commissioning is expected by the second half of 1987. The purpose of this industrial plant will be to supply slurry fuel to feed all the oil-designed boilers in the Porto Torres petrochemical complex. Finally, we should mention the basic design for the Agip Carbone project. This will be a slurry preparation plant with a coal beneficiation section and a capacity of 120,000 t/y of beneficiated coal-water mixtures.

In the development of the combustion technology since 1982 Snamprogetti has performed important combustion trials to check the performance of different REOCARB mixtures on a semi-industrial scale and to develop and select combustion systems suitable for industrial application. These trials were performed in close cooperation with important users and burner manufac-

TABLE 1

Recent Experience and Current Projects for Snamprogetti's REOCARB in Italy

Plant/Client	Location	Capacity (t/y of CWM)	Start
I.C.LAVIOSA	Livorno	100,000	March '85
ENICHEM-ANIC	Porto Torres	100,000	December '85
ENICHEM-ANIC	Porto Torres	500,000	Basic Design Starting
AGIP CARBONE	Vado Ligure	120,000	Basic Design Starting

TABLE 2

Combustion Trials Performed for Burner Development

Test Facilities	Burner Capacity (kg/h of CWM)
ENEL (Italy)	400–3800
Dumag (Austria)	100
Peabody-Holmes (U.K.)	500–2000
Combustion Engineering (USA)	1300–5200
Babcock-Wilcox (USA)	250
ENICHEM-ANIC (Italy)	3000

turers at their test facilities, whose main features are summarized on Table 2. These tests allowed Snamprogetti to verify the high atomizing properties of the REOCARB mixtures and the possibility of achieving combustion efficiency up to 99%.

THE U.S.S.R. PROJECT

Specific experimental work

The coal specified for the project has the characteristics shown on Table 3. The basic design phase started with the performance of specific tests on the coal to define the main design data and the specifications for the main equipment. Those tests were:

- optimization of the slurry characteristics to determine the best formulation (selection of the grain size distribution, to meet the requirements for combustion and to assure maximum achievable concentration, maximum allowable viscosity, amount of additive and energy consumption)
- pumping tests carried out in an 8-inch test loop and simulating the operating conditions expected in the pipeline. These tests were designed to check friction losses and to study the rheology of the mixture.

Other tests were formed to simulate the restart of the pipeline after a long shut-down. The procedure adopted for this experiment was:

- continuous pumping of the mixtures in the test loop for 200 hours at a constant velocity (transport simulation)
- shut-down of the loop for 400 hours
- restart of the flow.

TABLE 3

Main Characteristics of the Russian Coal

Ash	10%
Volatile Matters	40%
Fixed Carbon	50%
High Heating Value	6600 kcal/kg
Grindability	40–45 HGI

The slurry flow was restarted easily after a 400-hour shutdown at 1°C, which is the minimum operating temperature expected. Important work was done for the specification of the grinding equipment. The mills adopted for the project are conventional (ball and rod mills), but for this particular application accurate optimization and a study of their internal operation was necessary. This required definition of the optimum L/D ratio, the most efficient rotating speed, the filling factor, and the type and size of the grinding media, as well as analysis of the slurry flow along the mills.

Finally, the experimental work on the Russian coal was concluded with combustion tests. The final result was the formulation of a coal-water mixture meeting all the requirements for transportation, storage and combustion, with the following characteristics:

—design concentration : max 65%
—additive : 0.5% by weight
—top size : 350 microns
—viscosity : less than 800 cP at operating conditions
—stability : over 1 month (without stabilizing chemicals)
—combustion efficiency : 97–99% (achieved during combustion tests. Other tests are presently under way).

The latest combustion trials offered a good demonstration of the stability of the mixture. At the end of January, 1986, 160 t of slurry made with coal from the USSR was produced by the Laviosa plant at Livorno. 800 drums of that slurry were shipped to the USA for combustion tests. The drums were opened in the second week of March—50 days after preparation, shipment, and storage—and the slurry was found stable and fluid.

Description of the project

The main characteristics of the Belovo-Novosibirsk coal slurry project are summarized in Table 4. The slurry production plant at Belovo, with a nominal capacity of 3

TABLE 4

Main Characteristics of the Belovo-Novosibirsk Coal Slurry Project

Plant Capacity	3 million metric tons/yr (Dry Coal)
Location	Belovo
Process	Wet Milling Process
Production Lines	7
Capacity of Each Production Line	60 t/h (Dry coal)
Pipeline	20 in. × 256 km
Pumping Stations	3
Power Station	6 units × 220 MW/each
Location	Novosibirsk

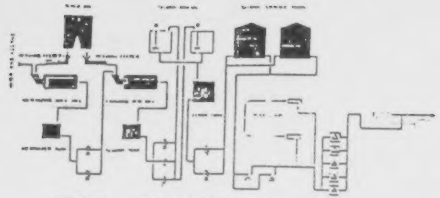

Figure 1. Slurry Preparation Plant and Initial Pumping Station at Belovo

million metric tons/yr of dry coal, will use a complete wet process designed to obtain slurries with the bimodal grain size distribution curve. The plant will consist of 7 production lines, each having a nominal capacity of 60 t/h of dry coal. The process scheme adopted for each production line is described on Figure 1. Dry ground coal with a top size of 6–8 mm is available at the battery limits of the plant in buffer storage bins. This coal is divided into two streams. The first stream is conveyed to the ball mill, where it is mixed with water and the fluidizing chemical. The product, a very fine slurry constituting the fine fraction of the bimodal curve, is pumped to the rod mill, where it is mixed with the second stream of dry ground coal. In this second grinding stage, which yields the coarse fraction of the curve, the specified grain size distribution and the final concentration are reached.

Then the slurry passes through mixers to improve its homogeneity and its rheological properties and is finally stored in two tanks with a capacity of 5000 m^3/each. These provide the buffer storage to feed the main pipeline. Before reaching the main pipeline, the slurry can be

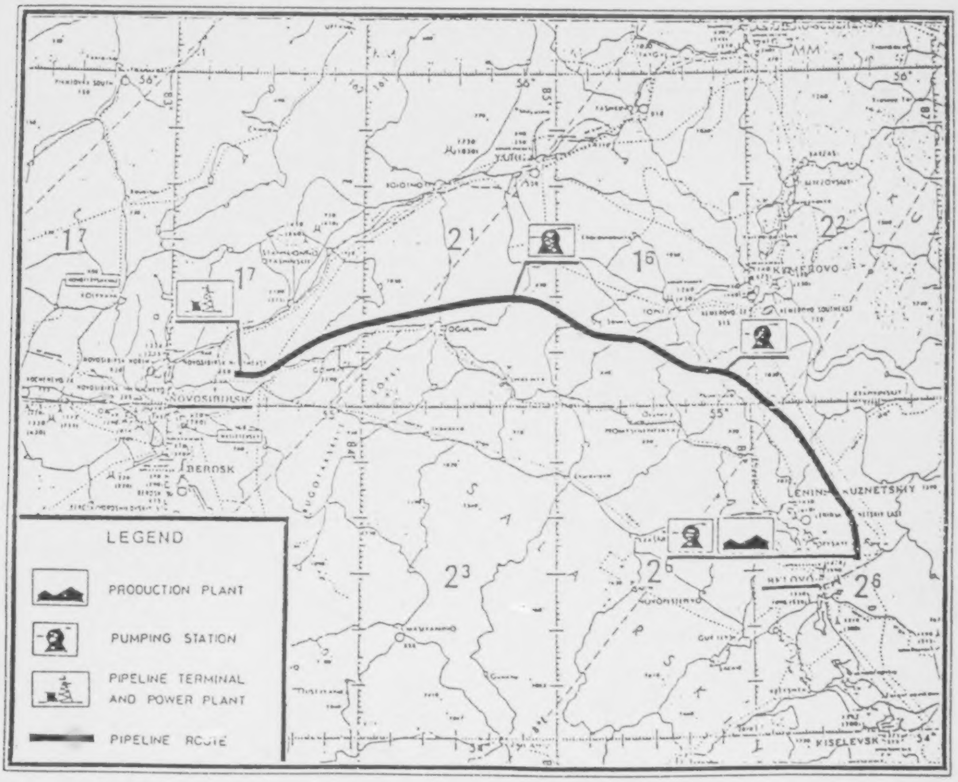
LEGEND
PRODUCTION PLANT
PUMPING STATION
PIPELINE TERMINAL AND POWER PLANT
PIPELINE ROUTE
NOVOSIBIRSK
BERDSK
KEMEROVO
LENINSK-KUZNETSKIY
BELOVO
KISELEVSK
56°
55°
54°
83°
84°
85°
87°

Figure 2. Belovo-Novosibirsk Coal Slurry Pipeline

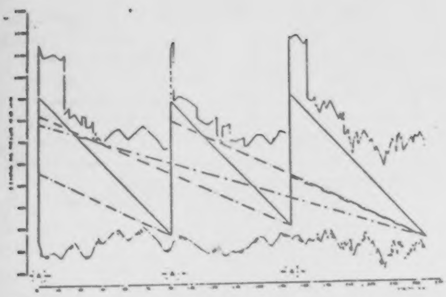

Figure 3. Coal Slurry Pipeline Belovo-Novosibirsk

pumped through the test loop, 1 km long with the same diameter as the main pipeline. The purpose is to monitor the main parameters of the mixture (flow rate, density, viscosity, friction losses), so as to act on the pipeline control system in case the characteristics of the slurry deviate from the established operating parameters.

The pipeline linking the Belovo plant to the power station at Novosibirsk will have a length of 256 km and a diameter of 20 in. (Figure 2). This size was specified by the client to accommodate a future increase of the throughput. The pipeline will be buried at a depth of 2 meters to maintain the slurry at temperatures above 1°C and to prevent freezing in Siberia's severe climate. Three main pumping stations are required: the first is at the initial end of the pipeline close to the production plant, while the second and third are located after 90 km and 170 km, respectively. Each pumping station consists of two main slurry pumps, reciprocating, single acting, triplex, driven by variable speed electric motors. Design capacity and design discharge pressure of each pump are 250 m³/h and 100 bars, respectively, while the installed power of each electric motor is 900 kW.

Additional reciprocating pumps, operating as stand-by units, will be supplied by the client. In case of failures in the intermediate pumping stations, it is always possible to assure the transport of the slurry to Novosibirsk at reduced flow rates, by-passing the second pumping station, the third, or both[1](Figure 3).

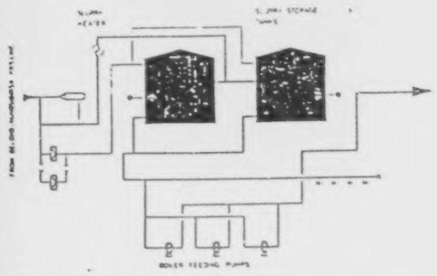

Figure 4. Pipeline Terminal at Novosibirsk

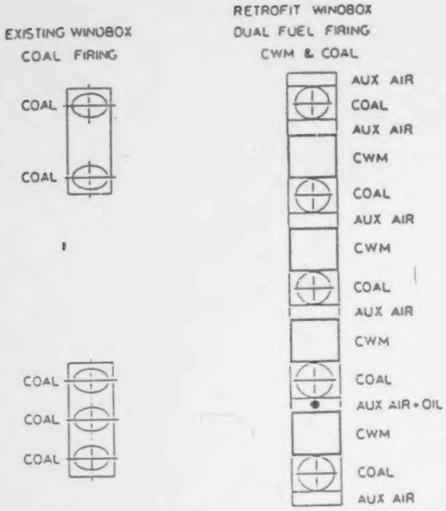

Figure 5. Conversion of the Boiler From Coal to Reocarb

The pipeline terminal (Figure 4) consists of two slurry storage tanks with a capacity of 20,000 m³ each. A heater/chiller unit is provided to maintain the slurry at the desired constant temperature. Side entering mixers in discontinuous operation maintain uniform temperature distribution inside the tanks. The thermal power station at Novosibirsk consists of six units with a capacity of 200 MW each. The boilers were originally designed to burn dry, pulverized coal in tangentially firing burners. In converting to the use of coal-water mixtures each boiler will adopt a new fuel feeding system, a new corner placement for the burners, and a compressed air system for the atomization of the mixtures.

Since it is considered useful to maintain the capability of burning coal-water fuels or dry coal, burners for CWM and for dry coal will be inserted at alternate elevations in each boiler windbox (Figure 5). Switching from one fuel to the alternative fuel will be performed automatically. Likewise, it will be possible to switch from coal or coal-water slurry to oil.

CONCLUSION

Snamprogetti has developed its coal-water mixture technology, with an emphasis on the production of an alternative fuel to heavy fuel oils and the development of an alternate mode of handling, transporting, and storing coal, through intensive theoretical and experimental activity, proven on a pilot scale and applied in demonstration plants in Italy.

The viability of this approach has been accepted by the Soviet Union, where the CWM technology will find an ideal application in the construction of the Belovo-Novosibirsk coal slurry project.

This project represents the first industrial application of the comprehensive CWM technology in the world, as it consists of an integrated system for production, transport by pipeline, and direct combustion of coal-water mixtures in a thermal power station. Hence, the Belovo-Novosibirsk coal slurry pipeline system will mark an important milestone in the development of both the CWM technology and the hydraulic transport of coal and should encourage further adoption of these technologies in the USSR and elsewhere.

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R.M. Braca, P.E.
President

Ref. 988
September 23, 1987

The Honorable Senator
J. Bennett Johnston
Chairman, Committee on Energy and
Natural Resources
United States Senate
Washington, D.C. 20510-6150

Dear Senator Johnston,

I wish to thank you for giving me the opportunity to appear as a witness before the Senate Energy and Resources Committee on September 10, 1987, in the hearing on the proposed coal pipeline legislation, S. 801, the "Coal Distribution and Utilization Act of 1987".

My participation in that hearing gave me an insight into the opposing arguments which I had not fully appreciated at the time I prepared my written and oral testimony. For this reason, I would like, if I am permitted, to submit for the record some additional comments and observations which may provide a different perspective in the debate on coal pipelines that has been going on for some years.

As I see it now, the debate has been conducted primarily on two issues, which recent technical and economic developments are rendering inconsequential as arguments to be considered in your committee's deliberations on this legislation.

The first issue relates to the coal-water technology per se and assumes that "conventional" coal-water slurry will be used as the transport medium in future coal pipelines. This assumption has raised concerns of environmental pollution and depletion of water resources. With the new coal-water fuel (CWF) technology, however, these are no longer major problems as I have explained in my written testimony.

I would emphasize the substantial advantages of CWF, which include:

1. A significant reduction in the consumption of water and pumping energy per ton of coal transported, to less than half of what is required with "conventional" coal-water slurry;
2. The possibility of including advanced coal beneficiation technologies in coal-water fuel plants, so that CWF can also fill the role of an urgently needed clean coal technology;
3. The elimination of the mechanical and environmental problems associated with dewatering "conventional" coal-water slurries at the pipeline's destination, since coal-water fuels are burned directly without dewatering;
4. And most important, the creation of a coal-water fuel alternative which can effectively replace fuel oil for many industrial and power plant applications.

The second issue focuses on the railroads which have consistently offered the strongest opposition to coal pipelines. To the railroads and its adversaries the main question seems to be: "Should coal be transported within the USA by railroad or by coal pipeline?"

This may very well be an academic question. The outlook is that even with the coal pipeline legislation in place the railroads will continue indefinitely to carry coal to the current and future users of dry coal. Coal pipelines will not take much, if any, of the business of supplying dry coal to the end-users because "conventional" coal-water slurry technology must be used when dry coal is the end product, and such pipeline projects will always encounter an opposing coalition of water conservationists, environmentalists and the railroads along the route that are prepared to reduce freight rates rather than lose a substantional share of the dry coal market.

For your information, the lower cost "concentrated" coal-water slurries used in CWF technology cannot be utilized to supply dry coal at the pipeline destination because such slurries cannot readily be dewatered after pipelining. The dispersant chemicals in the slurry have been added to prevent settling out of the coal and would effectively make dewatering extremely difficult and uneconomic.

I should now like to raise what I see is the central issue in the debate on coal pipelines, an issue which is more substantive and yet has hardly been discussed in this long standing controversy. It is:

> "How can the USA best replace imported oil with domestic coal, in order to reduce oil imports and the U.S. trade deficit?"

According to Platt's Oilgram, U.S. imports of crude oil and refined petroleum products have recently reached a level of approximately 7.5 million barrels per day. At an average landed price of about $20 per barrel, this amounts to $150 million per day or $55 billion dollars per year. If and when the price of oil re-escalates to $30 or more per barrel, sometime in the next five or ten years, and assuming that oil import quantities remain at present levels, then the contribution of imported oil to the U.S. trade deficit will rise to $80 billion or more.

If we examine the coal-water fuel solution as one way to mitigate this national burden, we find here an ironic situation indeed, and an inconsistency of purpose. We might expect that coal-water fuel and imported oil would have the same opportunities and follow the same ground rules in competing for the U.S. energy markets. But that is not the situation in reality!

Today, much of the imported oil and/or its refined products move inland from U.S. ports to refineries and end-users via "eminent domain" oil pipelines. In the present situation domestic coal-water fuels would be denied that privilege and would be restricted to other means of transport. No business man in his sound mind would invest in coal-water fuel facilities with such a marketing handicap. This is also the reason why R&D work on pipelining coal-water fuels has been neglected by U.S. firms. There is little or no incentive to spend research money on a dead-end situation.

By any process of logical reasoning we may use, we are led to the conclusion that coal-water fuels and coal pipelines are clearly in the national interest. It would be economically irresponsible to ignore this and to accept the specious arguments that have been presented against the proposed coal pipeline legislation. In fact, I have heard no argument or concern which has sufficient validity to override the obvious need and urgency for the U.S. to reduce its trade deficit, avoid a further weakening of the U.S. dollar and prevent another inflationary spiral.

The facts are: coal pipelines and coal-water fuels will create new initiatives which will increase revenues and jobs for coal and related industries, without taking any away from the railroads; oil imports will be reduced; and in a more efficient domestic environment, coal exports may be increased.

And for all this, there is practically no price to pay -- no subsidies, no tariffs and little inconvenience. Overall, and in every respect, the United States economy will be strengthened.

With sincere regards,

R.M. Braca
President

Attachment: Article from The Oil Daily
"Political Problems Snag Coal-Water
Slurry Fuel Lines"
September 23, 1987

CC: United States Senate

Dale Bumpers, Arkansas
Wendell H. Ford, Kentucky
Howard M. Metzenbaum, Ohio
John Melcher, Montana
Bill Bradley, New Jersey
Jeff Bingaman, New Mexico
Timothy E. Wirth, Colorado
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Malcolm Wallop, Wyoming
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Don Nickles, Oklahoma
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Daniel J. Evans, Washington

Patricia Beneke, Esq.

CC: United States House of Representatives

- Morris K. Udall, Arizona, Chairman
- George Miller, California
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- Barbara F. Vucanovich, Nevada
- Ben Blaz, Guam
- John J. Rhodes III, Arizona
- Elton Gallegly, California
- Richard H. Baker, Louisiana

THE OIL DAILY, WEDNESDAY, SEPTEMBER 23, 1987

Political Problems Snag Coal-Water Slurry Fuel Lines

By John A. Moore

Oil Daily Sept 23 '87

WASHINGTON — Coal-water slurry fuel "right out of the pipeline" can compete with fuel oil, if the pipelines can be built, a House panel heard Tuesday. Problems standing in the way of building them are neither technical nor economic, but political, the Committee on Interior and Insular Affairs heard.

R. M. Braca, president, Snamprogetti USA Inc., a world-scale pipeline constructor, called for Congress to grant coal slurry pipeline operators the right of eminent domain. Without it, such a pipeline can't be built, he said.

Chemicals Added

Braca described a slurry which travels through a pipeline like oil does. Resembling thick oil in consistency, it contains finely ground coal particles and less water than "conventional" coal slurries. Chemicals are added to improve transit and storage abilities. Braca said that after arriving at pipeline terminals from mine mouth preparation plants, it can be stored handily in tanks, and is readily transportable in tank trucks or rail tank cars.

Facilities in Italy already are burning such coal-water slurry fuel, and a major pipeline and power station application is slated to begin operation in the Soviet Union next year.

Braca said the slurry product can be burned in power plant and industrial boilers, fluidized bed combustors, gas turbines, coal gasifiers, co-generation plants, cement kilns, metallurgical plants, and stationary and marine diesel engines. Eventually, he said, it could be adapted for use in larger mobile diesel engines, such as for earth moving or railroad locomotives.

'Ironic Situation'

Braca warned that if proposed legislation for coal pipelines is rejected, the United States will be confronted by "an ironic situation indeed".

He pointed out that, if this hap-

(Continued on page 2)

Coal-Water Slurry Fuel Pipelines Snagged on Political Problems

(Continued from page 1)

pens, "imported oil now moves inland via eminent domain interstate pipelines, but domestic coal-water fuel would be denied that..."

House Interior chairman Morris K. Udall, D-Ariz., has pursued coal slurry legislation for more than a decade. In announcing his current effort, Udall said that granting slurry pipelines eminent domain would lower the cost of coal and create 350,000 new jobs in the industry.

Udall says that the high prices charged by railroads have triggered the recent decline in coal exports and rise in imported coal. Approximately half of the delivered cost of coal is in freight charges.

Despite these arguments, opposition to a slurry pipeline remains strong. Opponents say a slurry pipeline threatens the railroad industry, by raising rates for other commodities. And the use of scarce western water supplies in slurry pipelines remains an unsettled point of major dispute.

The CHAIRMAN. Thank you very much, Mr. Braca.

Now, we are happy to welcome back to the committee our distinguished lawyer on the subject. Water is what you talked about last time, and I would expect you would talk about water and whatever else you would like to talk about at this time.

Mr. Edward Clyde.

STATEMENT OF EDWARD W. CLYDE, ATTORNEY AT LAW

Mr. CLYDE. Thank you. I understand you want to finish at noon. I had written a summary, but I am going to not use it. I am going to summarize where we are sort of extempo.

My name for the record is Edward W. Clyde. I live in Salt Lake City, UT. I am and for 45 years have been a practicing attorney. I have concentrated my practice in all branches of natural resource law, but with special emphasis in the field of water law. I have taught mining and water law at the University of Utah for a number of years. I resigned that when I became chairman of the University Board of Regents. I have been chairman of the Water Law Committee and chairman of the section on natural resource law for the American Bar. I practice pretty much throughout the West either trying major cases or consulting as far east as South Dakota, as far north as Montana, and all the areas around Utah.

I am here not on behalf of any private client, but at the invitation of the committee staff.

I have read Senate bill 801 primarily to determine what impact it will have on water. I am absolutely, unequivocally satisfied that the traditional role of the States is preserved.

The traditional role need not have been given to the States by the Federal Government because initially the Federal Government was the proprietary owner of western land and water. It certainly could have elected to manage them as it has oil and gas. But it permitted silently—silent acquiescence—the settlers to come in and start using the land and the water. The courts were adjusting rights between trespassers when we finally got true landowners out after the land acts of the early 1860's. Courts here and there were supporting riparian rights, and Congress in 1866 adopted a statute that said when rights to water have gelled under local customer-local law, they are affirmed by Congress.

For the next 121 years Congress has deferred to the States. The States have the role of allocating water and managing the use and the distribution of it. This statute preserves that role.

And I say that unequivocally because we have a counterpart in section 8 of the National Reclamation Act of 1902. That section says that the reclamation people will get water rights for Bureau projects under State law.

There has never been any reluctance on the part of the courts in the ensuing 85 years to enforce that language. It was looked at in depth in 1978 by the *United States Supreme Court, California* v. *United States* case. In that case the Bureau did file for water for a dam authorized by Congress. California did approve it, but it imposed 25 conditions indicating that beyond approval of the appropriation of water, it was going to manage and control the use.

It went to the U.S. Supreme Court as to whether those conditions could obtain, and the U.S. Supreme Court said yes. It recognized that Congress still has the ability to preempt, and if a State regulation flies in the very teeth of a clear congressional mandate, the congressional mandate would control, that where there is not a congressional clear mandate, the States do have the right to regulate even distribution and use under the Federal projects.

If anybody has any doubt at all that the States' role is preserved, they should read the *California* v. *United States* case. It is cited in the brief. It is a 1978 case. It has an accurate and fairly complete history of the development of western water law and the dual role and partnership of the State and Federal Government.

I am an attorney for the Central Utah Project in Utah, and I was asked by the board of directors to prepare a series of papers for laymen bringing them a working knowledge of the law that they have to interface in the discharge of their duties. In connection with that, I wrote a paper called "Historical Development of Western Water Law and the Roles of the State and the Federal Governments Therein." I don't want to refer to it, but I would like to file it as a part of the record for those who might want a little bit more detail about this partnership.

The CHAIRMAN. Without objection, we will put that in the record.

Mr. CLYDE. Thank you.

The statute does I think also preserve the traditional role between the State and the Federal Government. That is working well. It has been 121 years in development. It is working all right. I think it is important to reserve it.

There are some problems that are local in nature, and the Congress has always deferred to the States. There are some that are clearly Federal in nature: interstate streams, international streams, pollution of interstate streams, obstructions to them. I don't believe the States may ever have been able to get criteria on Lake Powell by agreement. Congress provided them. So, the Federal role is just as important as the State. That is preserved.

Finally, I believe that the States are enhanced if this bill is passed, in their ability to control water for interstate pipeline. The U.S. Supreme Court in the *Sporhase* v. *Nebraska* case held that water was an article of commerce and that the State could not, in order to preserve the water for its own citizens, embargo the export of water. But for this statute, the States would have very little control over the export of water for coal slurry pipelines.

Congress does have the power to regulate Congress, but the Supreme Court for 100 years has indicated it can exercise that power in various ways. One way is to do what this bill does, delegate it to the State. I have addressed that in detail in my written statement.

But in summary, this will not adversely impact State control over allocation, management and distribution of water. It does not disrupt the State and Federal partnership. And it enhances the States' right to control water for coal slurry pipelines because it permits restraints on the export of water which but for this bill would be prevented by Sporhase.

Thank you.

[The prepared statement and paper submitted by Mr. Clyde follows:]

STATEMENT OF

EDWARD W. CLYDE

ATTORNEY AT LAW

BEFORE THE

SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

ON S.801

COAL DISTRIBUTION AND UTILIZATION ACT OF 1987

ON

SEPTEMBER 10, 1987

BEFORE THE SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES

HEARINGS ON S. 801

STATEMENT OF EDWARD W. CLYDE, ATTORNEY

My name is Edward W. Clyde. I live at 1329 Blaine Avenue, Salt Lake City, Utah.

I am an attorney engaged in private law practice for approximately 45 years. In the 1940s I served as an Asst. Attorney General, representing the Utah State Water Engineer and other State Natural Resource Departments. I then taught Water and Mining Law at the University of Utah Law School for several years on a part time basis, I have throughout my years of private law practice specialized in the field of western water law. My practice has extended into several Western states, including Utah, Montana, Wyoming, Idaho, South Dakota, Nevada, Colorado and New Mexico. I will let that suffice as a statement of my experience and refer you to the resume attached to this statement.

I testified before this Committee in 1982 on S. 1844 and again in 1983 on S. 267. At the time of my testimony on these two prior occasions I was legal consultant to Energy Transportation Systems Inc. (ETSI), in regard to its acquisition of water for a proposed coal slurry pipeline project. I also was the lead attorney for ETSI in negotiating a water contract with the State of South Dakota for that line. However, my appearance here is at the invitation of the Committee staff and I do not presently represent anyone who is proposing to construct a coal slurry pipeline.

I have examined S. 801 and am of the opinion that it expressly and adequately preserves the traditional relationship between the western states and the United States of America in regard to the appropriation, use and administration of water. In my opinion it is important for the Congress to express its intent in regard to water -- as this proposed legislation does -- rather than to remain silent and leave the intent of the Congress to be inferred by the courts. I am not critical of the Reserved Rights doctrine, which has been developed by the courts. Under this doctrine the courts have held that when the United States withdraws lands for particular federal purposes, it is to be inferred that Congress also intended to withdraw some undefined quantity of water, so that the withdrawn lands can be used for the intended purpose. I think it is much better for the Congress to express its intent, rather than to leave it for the courts to infer. For example, I seriously doubt that in 1928 any sponsor of the Boulder Canyon Project Act (Act of Dec. 21, 1918, ch. 42, 45 Stat. 1066) thought he was asking the Congress to apportion the waters of the lower Colorado River among Arizona, Nevada and California. Yet in 1973 a divided U. S. Supreme Court held that this is what Congress had done. Where the Congress elects to remain silent and to leave the problem to the courts, it creates uncertainty. The problem of quantifying the amount of water reserved is left for future court decision. This often results in protracted litigation. The amount of water reserved for

Indian tribes under a doctrine pronounced by the U. S. Supreme Court as early as 1907 is still largely unresolved. A new area for litigation is reflected by the court's holding in Sierra Club v. Block, 622 F. Supp. 842 (D.C. Col. 1985). There the U. S. District Court of Colorado inferred that the Congress intended to withdraw an unspecified amount of water in connection with the creation of wilderness areas and it appears that the water reserved for each wilderness area will have to be litigated.

S. 801 addresses the impact of this legislation on water and water rights in several sections. These are noted in Appendix A hereto.

It is my opinion that the language of the Act is completely adequate to express the congressional intent to preserve for the States their historic and traditional role in the allocation and administration of water rights. There is no reason to assume that the courts will do otherwise than uphold and apply this clearly expressed intent. Congress expressed a similar intent in Section 8 of the National Reclamation Act of 1902, (Act of June 17, 1902, ch. 1093, §8, 32 Stat. 388). There the Secretary of Interior is directed to secure water for Bureau of Reclamation projects under State law. In a relatively recent case, California v. United States, 438 U.S. 645 (1978), the court elaborately discussed the history of Western water law and specifically enforced Section 8 as written.

A similar result was reached in Imperial Irr. Co. v. Yellen, 447 U.S. 352 (1980). There the court was construing analogous language (Sec. 6) in the Boulder Canyon Project Act and its holding again strongly suggests that it will uphold the mandate of Congress to protect the application of State water law to Federal projects where the Congress so specifies. There Sec. 6 required the Secretary to recognize "present perfected rights". A "perfected right" had been defined in Arizona v. California, 373 U.S. 546 (1963) as:

> . . .a water right acquired in accordance with state law, which right has been exercised by the diversion of a specific quantity of water that has been applied to a defined area of land or to a definite municipal or industrial work.

The decision in the Imperial case was unanimous. It held that section 6 required the Secretary to deliver water to lands covered by such state-derived water rights, irrespective of their acreage, and thus exempted such lands from the acreage restrictions in the federal reclamation laws, which direct the Secretary not to deliver water to lands in excess of 160 acres per owner. The Court noted:

> In the first place, it bears emphasizing that the §6 perfected water right is a water right originating under state law. In Arizona v. California, we held that the Project Act vested in the Secretary the power to contract for project water deliveries independent of the direction of §8 of the Reclamation Act to proceed in accordance with state law and of the admonition of §18 of the Project Act not to interfere with state law. 373 U.S. at 586-588, 10 L.Ed. 2d 542, 83 S.Ct. 1468. We nevertheless clearly recognized that §6 of the Project Act, requiring satisfaction of present perfected rights, was an unavoidable limitation on the Secretary's power and that in providing for these rights the Secretary must take account of state law. In this respect, state law was not displaced by the Project Act and must be consulted in determining the content and characteristics of the water right that was adjudicated to the District by our decree.

I believe that it is highly desirable to protect the traditional roles of the State and Federal governments in the appropriation, use and administration of water as those roles have evolved over the past 121 years. From my 45 years of law practice in the water law field, it is my observation that the present relationship is working reasonably well. The law has gelled to a point where much of the uncertainty as to where jurisdiction lies has been removed. The individual seeking to use the water is really not much concerned about whether he has to comply with a Federal law -- such as he does in subscribing for water from Federal reclamation projects -- or whether he has to comply with State law. What the user needs is reasonable certainty of expectations. The present accommodation between the State and Federal governments has gelled to a point where that certainty can be provided.

The United States acquired most of the Western lands as a proprietary owner. At that point the United States also had the legislative powers vested in it by the U. S. Constitution. Article IV, Sec. 3, clause 2 of the Constitution vests in Congress the power "to dispose of and make all needful Rules and Regulations respecting the . . . property belonging to the United States." This constitutional language was explained and applied in Alabama v. Texas, et al., 347 U.S. 272, 273, 98 L.Ed. 689, 74 S. Ct. 481 (1954) reh. den. 347 U.S. 950, 98 L.Ed. 1097, 74 S. Ct. 674 (1954) as follows:

> The motions for leave to file these complaints are denied. Article IV, §3, Cl. 2, United States Constitution. United States v. Gratiot, 14 Pet. 526, 537, 10 L.Ed. 573: The power of Congress to dispose of any kind of property belonging to the United States "is vested in Congress without limitation." United States v. Midwest Oil Co., 236 U.S. 459, 474, 35 S.Ct. 309, 313, 59 L.Ed. 673: "For it must be borne in mind that Congress not only has a

legislative power over the public domain, but it also exercises the powers of the proprietor therein. Congress 'may deal with such lands precisely as an ordinary individual may deal with farming property. It may sell or withhold them from sale.'. . ." United States v. California, 332 U.S. 19, 27, 67 S.Ct. 1658, 1663, 91 L.Ed. 1889: "We have said that the constitutional power of Congress [under Article IV, §3, Cl. 2] is without limitation."

Congress could have elected to control the use and ultimate allocation or disposition of Western water as it has elected to control the leasing and disposal of federal lands and mineral resources. However, in the beginning, when the Mormons settled Utah and the gold miners descended upon California, they used the Federal lands, the Federal minerals and the Federal water under local customs and local laws. The United States silently acquiesced. By the early 1860s Congress had provided means by which a private individual could acquire ownership in Federal lands and new owners here and there were successfully asserting the riparian rights doctrine (based on ownership of riparian land) to divest those who had made a prior use of the water under local law. See Union Mill & Mining Co. v. Ferris, 24 Fed. Cas. 594 (No. 14371) (C.C.D. Nev. 1872); VanSickle v. Haines, 7 Nev. 249 (1872).

Congress responded, by confirming the acquisition of water rights in accordance with local customs. It adopted a general statute dealing, for the most part with mining claims (Act of July 26, 1866, ch. 262, 14 Stat. 251), which simply said that whenever by priority of possession rights to the use of water for mining, agriculture, manufacturing or other purposes have vested and accrued, and the same are recognized and confirmed by local customs, laws and decisions of the courts, the owner of such rights shall be protected in the same.

The Act of 1866 was construed by the U. S. Supreme Court to be "a voluntary recognition of a pre-existing right of possession constituting a valid claim to" the continued use of the water, rather than "the establishment of a new one," and the courts were bound to protect rights which had vested under local custom, whether initiated prior to or after the passage of that act. See Broder v. Water Co., 101 U.S. 274 (1879).

In 1877, with the enactment of the Desert Land Act, Congress further aided those States desiring to reject the claim of riparian rights by severing the water from patents to the public land. After that Act no United States patent to lands in specifically named western states would carry with it any interest in the water of non-navigable streams. In construing this Act, the U. S. Supreme Court in California Ore. Power Co. v. Beaver Portland Cement Co., 295 U.S. 142, 162 (1935) said:

> As the owner of the public domain, the government possessed the power to dispose of land and water thereon together, or to dispose of them separately. . . .The fair construction of the provision now under review is that Congress intended to establish the rule that for the future the land should be patented separately; and that all non-navigable waters thereon should be reserved for the use of the public under the laws of the states and territories named.

Thus, the right of each state to adopt its own system of water law to govern the appropriation of non-navigable waters was granted by Congress and confirmed repeatedly by the U. S. Supreme Court. See Nebraska v. Wyoming, 325 U.S. 589 (1945); California Ore. Power Co. v. Beaver Portland Cement Co., supra; Kansas v.

Colorado, 206 U.S. 46 (1907); Clark v. Nash, 198 U.S. 361 (1905); United States v. Rio Grande Dam & Irr. Co., 174 U.S. 690 (1899).

These statutes are in the nature of an "offer" to the public. They permitted the waters to be appropriated for private use by following state law and local custom. Until the water is so appropriated, however, the ownership rights relating to water on the public domain continue in the United States. If the United States were to elect to repeal these statutes and thus to withdraw the offer as to unappropriated waters on Federal lands, there is no theoretic reason why it could not do so. However, where private appropriators have perfected water rights in accordance with state law, as permitted by these Federal statutes, the rights would vest. The Federal offer has been accepted, and generally speaking the right cannot thereafter be taken by the Federal government, or by anyone else, without compensation. See Hunter v. United States, 388 F.2d 148 (C.A. 9 Cal. 1967).

There are a number of bases for Congress to assume jurisdiction over unappropriated Western water as a matter of power. One is the above noted Federal proprietary interest. Among the other sovereign powers are the power (a) to regulate commerce (which has been extended to non-navigable tributaries which can affect navigation); (b) to make treaties; (c) to provide for the general welfare; (d) to provide for the national defense; (e) to regulate the use of water reserved to the Indians; and (f) to authorize interstate compacts. The U. S. Supreme Court held in Cooley v. Board of Wardens, 33 U.S. 299, (12 How.) (1851) that Congress cannot by statute alienate these Federal constitutional powers. While the case is an old one, it was cited with approval by the U. S. Supreme Court in July of 1982, in Sporhase, infra, and is still good law.

However, for more than 121 years the Congress of the United States has recognized that many of the problems relating to water allocation and use are local in nature and ought to be controlled by the States. Congress, accordingly, has generally deferred to the States on water allocation. It must be recognized, however, that in the very nature of things there are some problems which are Federal. Obstacles constructed across navigable streams have to be regulated if navigability is to be protected. The licensing and regulation of such structures is placed under the control of Congress by the Constitution. The power to regulate and license such structures does not need also to embrace control over the appropriation of project water. Users of water above and below the licensed dam will have initiated their rights under State law. It will in no way interfere with the Federal government's power to protect the navigability of streams to require the procurement of a federal license for the obstruction, and then to require the securing of water rights in accordance with State Law. This was the scheme provided for on reclamation projects by §8 of the National Reclamation Act of 1902.

There are other areas where Federal intervention is necessary and desirable. For example, the individual State has difficulty coping with upstream pollution of an interstate stream. It is doubtful that the States would have been able to agree on filling criteria for Lake Powell -- water withheld in storage to fill Lake Powell would not be available for the generation of power and the supplying of water from Lake Mead. Congress adopted the necessary filling criteria. Again using the Colorado River as an example, only the United States, through its treaty-making power could have dealt with the claims of Mexico. The reservation and administration of water for the Indians also, in my opinion, are Federal problems. The accommodation between the State and Federal jurisdiction is well developed. It is working all right. The superior power may, in many of these areas, rest with the Congress, but conflicts in the past have been resolved as a matter of policy, rather than of power. This policy has left with the States the appropriation and administration of water. In my opinion, it is desirable to leave it there. This proposed legislation does so.

I assume that the language of Section 5(b) of S. 801 authorizing State restraints on interstate commerce is in response to the U. S. Supreme Court decision in Sporhase, et al. v. Nebraska, ex rel. Douglas, Attorney General, 458 U.S. 941, 102 S. Ct. 3456 (decided July 2, 1982). In Sporhase the State of Nebraska had enacted a reciprocal statute which would permit Nebraska water to be used outside the State of Nebraska only if the sister State had a similar reciprocal statute. It prohibited out-of-state use otherwise. The U.S. Supreme Court held that this was an unconstitutional restriction on interstate commerce. In so holding the majority opinion indicated three bases for congressional.

First, the court noted the multi-state character of the Ogallala ground water aquifer and said that the interstate nature of the aquifer confirms the view that there is a federal interest in conservation, as well as in the fair allocation of the diminishing resource -- citing Arizona v. California, 373 U.S. 546 (1963). In the Arizona v. California case the Supreme Court had held that Congress had the power to apportion the waters of an interstate stream and that by adopting and implementing the Boulder Canyon Project Act it had in fact made such an allocation of the Lower Basin waters of the Colorado River among the Lower Basin States.

Secondly, the court notes that Congress has the power under the commerce clause to regulate an interstate ground water basin.

Third, the court notes that the overdraft of the Ogallala Aquifer is a national problem and Congress has the power to deal with it on that scale. It is this statement which has given the states the greatest concern, but the court has long held that Congress has the power to provide for the general welfare and can do so in the field of water law. See Ivanhoe Irr. Dist. v. McCracken, 357 U.S. 275 (1958), where the court said that in developing Federal water projects, the United States had expended federal funds for a valid public and national purpose -- the promotion of agriculture. "This power flows not only from the General Welfare Clause of Art. I, Section 8 of the Constitution, but also from Art. IV, Section 3, relating to the management and disposal of federal property."

The Commerce Clause doctrine arises out of a negative inference from the constitutional grant of power to the U. S. Congress and is really an implied, rather than express, limitation on state interference with interstate commerce. However, as the U. S. Supreme Court stated in Southern Pacific Co. v. Arizona, 325 U.S. 761, 769 (1945), since it is the power of Congress to begin with, Congress has the power to "redefine the distribution of power over interstate commerce" so as to "permit the states to regulate commerce in a manner which would not otherwise be permissible. . . ." In the case of Prudential Insurance Co. v. Benjamin, 328 U.S. 408 (1946), the Supreme Court upheld the concept that Congress has the power to consent to State regulation of commerce even though that regulation would otherwise run afoul of the dormant Commerce Clause.

The Southern Pacific Co. case was cited with approval by the U. S. Supreme Court in a decision rendered February 28, 1983 in the case of White v. Mass. Council of Const. Employers, 460 U.S. 204, 216. The court there said:

> . . .Where state or local government action is specifically authorized by Congress, it is not subject to the Commerce Clause even if it interferes with interstate commerce. Southern Pacific Co. v. Arizona, 325 U.S. 761, 769 (1945). Thus, if the restrictions imposed by the city on construction projects financed in part by federal funds are directed by Congress then no dormant Commerce Clause is presented.

The court also suggested in Sporhase that there may be a legitimate State reason permitting the State to formulate a program which would include restrictions on the exporting of water. I believe the protection of water allocated to a State under interstate water compacts approved by Congress would fall into this category. It has, of course, long been recognized that the State can place restrictions on commerce to protect overriding State interests, such as, for example, restricting the interstate transportion of gambling devices in order to protect State policy prohibiting gambling; or the interstate shipment of fruits and vegatables to protect against the spread of insects or disease.

In any event, it is my opinion that the language of Sec. 5(b) of S. 801 provides the required congressional consent to permit the States to regulate commerce, in regard to water for interstate coal slurry pipelines, in a manner which Sporhase would otherwise have prevented. Where the Constitution grants to Congress the power to legislate, it may discharge its legislative function by adopting State laws, present or prospective. See United States v. Sharpnack, 355 U.S. 286 (1958); Prudential Insurance Co. v. Benjamin, 328 U.S. 408 (1946). Congress may also remove the obstacles to State legislation, which will permit the State itself to legislate directly upon the subject, even though Congress cannot by statute relinquish its sovereign powers to the several States. See Butte City Water Co. v. Baker, 196 U.S. 119 (1905); and Wilkerson v. Rahrer, 140 U.S. 545 (1891); Cooley v. Board of Wardens, 53 U.S. (12 How.) 299 (1851).

In short, S. 801, if adopted, will, in my opinion, preserve the traditional role of the western states and the federal government in the allocation and use of Western water; the courts almost certainly would so hold. Further, the proposed legislation will permit state restrictions on the export of water for coal slurry pipelines in ways which but for this legislation would not be permissible.

APPENDIX A

S. 801 addresses the impact of this legislation on water and water rights in the following language:

"FINDINGS AND PURPOSE

"Sec. 2(a) The Congress hereby finds and declares that--

. . . .

"(7) the water resources of the States are necessary for the development of other resources within those States, and State water laws or terms and conditions of permits and authorizations for the appropriation, use, and diversion of water that restrict, limit, or condition the export of water in interstate coal pipeline distribution systems are reasonable and permissible means for the protection of the resources and the public interests of States;

"(8) State water law and interstate compacts are carefully balanced and structured systems for the allocation of water;

"(9) the national interest is best served by developing interstate coal pipeline distribution systems pursuant to those State water laws, interstate compacts, and laws governing the interstate allocation of water, including, notwithstanding any adverse impact such law may have on interstate commerce, laws relating to or prohibiting the export or use of water within or outside the State granting or denying such export or use; and

"(10) the need for a national coal distribution system is subservient to the national interest in the primacy of State water law, interstate compacts, and laws governing the interstate allocation of water."

"DEFINITIONS

"Sec. 3. For the purposes of this Act the term--

. . . .

"(7)(A) 'State water law' includes but is not limited to all substantive and procedural State constitutional provisions, statutory law, judicial decisions, administrative regulations, and administrative decisions authorized by the State which apply to water; and"

. . . .

"EMINENT DOMAIN AUTHORITY

Sec. 4.

. . . .

"(f) EMINENT DOMAIN AUTHORITY.--(1) Any person proposing to build an interstate coal pipeline distribution system, the construction of which has been determined by the Secretary to be in the national interest, may, after making good faith efforts to acquire, such rights-of-way by negotiations between such person and private landowners, acquire rights-of-way over, under, upon, or through private lands by exercise of the power of eminent domain in the United States district court for the district in which such lands are located or in the appropriate court of the State in which such lands are located. In any action or proceeding to acquire rights-of-way under this section, such action or proceeding shall conform to the laws, practices, and procedures relating to the general eminent domain law of the State where the property is situated, except that in the case of any such State law, practice, or procedure, the effect of which would prohibit any acquisition under this section, or which discriminates against interstate coal pipeline distribution systems, such State law, practice or procedure shall not be applicable,

"(2) Nothing in this section shall be construed to permit any person to acquire any water right through the exercise of the power of eminent domain granted under this Act.

"(3) No interstate coal pipeline distribution system constructed pursuant to the authorities of this section shall be considered to be a Federal project for purposes of the application for or assignment of water rights."

. . . .

"PRIMACY OF STATE WATER LAW

"Sec. 5.

. . . .

"(b) In full recognition of its powers under Article I, section 8 of the United States Constitution, Congress expressly delegates to the States the power to regulate the use or export of water in interstate coal pipeline distribution system, through State water laws, notwithstanding any adverse impact such delegation may have on interstate commerce or on any interstate coal pipeline distribution system. This delegation expressly includes but is not limited to provisions of State water law which provide for the establishment or exercise of terms or conditions (including terms or conditions terminating use or relating to or prohibiting the export of water) on permits or authorizations, for, interests in, or rights to control, reservation, appropriation, purchase, transfer, use, diversion, dedication, distribution, acquisition, exercise, export or claim of water for the export or use in any interstate coal pipeline distribution system."

Edward W. Clyde
Given to CUP Board
10-9-86

HISTORICAL DEVELOPMENT OF WESTERN WATER LAW AND THE ROLES OF THE STATE AND FEDERAL GOVERNMENTS THEREIN

Water is one of the most abundant and widely distributed substances on the face of the earth. Yet, it is such a common part of our daily life that we sometimes fail to realize just how important it is.

Water everywhere is finding extensive use in science and industry. We use it as a solvent and as a catalyst. It is a conveying medium for the transport of materials, both by ship and by pipeline. It is almost indispensable to the disposal of wastes. It is extensively used in the production of power and heat and in air conditioning and in refrigeration. It is necessary to the cells of all plants and animals, and in the crystals of many minerals. We use it to water-flood our oil fields, and to landscape and beautify. We swim in it, play on it, camp by it and fish from it for an important part of the world's food supply. And we waste appalling quantities of it through pollution.

Here in America a family of four uses 550 gallons of water per day in the home. Animals use about 10 tons of water for each ton of animal tissue. It takes 250 tons of water to produce one ton of paper; 600 tons of water to produce one ton of nitrate fertilizer. In agriculture we use 1,000 tons of water to produce one ton of sugar or one ton of corn, 1,500 tons of water for one ton of wheat, 4,000 tons of water for one ton of rice and 10,000 tons of water for one ton of cotton.

Even though water is abundant, the entire world is running out of fresh water at an alarming rate. The problem would, of course, vanish if somehow the vast oceans could be made drinkable and then could be distributed at reasonable cost. When the United States opened its first desalination plant at Freeport, Texas, President Kennedy said that the process of removing salt from sea water could "do more to raise men and women from lives of poverty and desperation than any other scientific advance."

In the semi-arid west, there simply is not enough water to supply all of the competing needs. We also are seeing a change in the law regarding beneficial use. In the past the courts were reluctant to sustain the appropriation of water for instream uses or for recreation, or to protect aesthetic values. However, such uses are finding protection in the law, and are increasing the competition for the limited water supply.

The fabric of what is now the main body of our resource law was woven at a time when our population was relatively small. The continent was seen as a vast frontier with resources almost inexhaustible. Resource law developed along patterns which would encourage development. It is thus logical that early writers would speak of the law keeping pace with industrial progress and of the nation's laws being a history of the economic forces which created the laws.

It was recognized from the very beginning that the federal government was the proprietary owner of the lands in the western states. Alabama v. Texas, 347 U.S. 272 (1954); U.S. v. Rio Grande Dam and Irrigation Co., 174 U.S. 102 (19__). Congress, by its silence, was held to have assented to the general occupation of these lands. Atkinson v. Peterson, 87 U.S. 507 (1874). In 1866 Congress confirmed acquisition of water rights in accordance with the local customs. It did so by a general statute dealing, for the most part, with mining claims. (Act of July 26, 1866, Chapter 262, 14 Stat. 251). The Act simply said that whenever by priority of possession, rights to the use of water for mining, agriculture, manufacturing, or other purposes, vested and accrued and the use is recognized and confirmed by local customs, laws and decisions of the courts, the owner of such right shall be protected in the same. This Act of 1866 was construed by the United States Supreme Court to be a "voluntary recognition of a pre-existing right of possession, constituting a valid claim to" the continued use of the water, rather than "the establishment of a new one", and the courts were bound to protect rights which had vested under local custom, whether initiated prior to or after the passage of that Act. Broder v. Water Co., 101 U.S. 274 (1879)

Since the United States originally owned, as a proprietor, the land in the western states, all settlers were trespassers against the government. Miners and farmers alike were diverting water from its accustomed channel and taking it for use on distant lands. Others were locating along the banks of the streams and claiming, under the riparian doctrine, the right to have the water stay in its accustomed channel. The courts ruled against these riparian settlers and in favor of the first appropriator because the settlers, owning no riparian lands, were not in a position to assert the riparian rights doctrine.

The original precedent for the doctrine of prior appropriation is generally considered to be the California case of Irwin v. Phillips, 5 Cal. 140 (1855). There the plaintiff had diverted water from a stream running through public lands and transported it to mining lands located some distance from the stream. Subsequently the defendant located along the banks of the stream and asserted the right to have the water remain in its accustomed channel in accordance with the doctrine of riparian rights. In rejecting the defendant's claim the court said that it was required to take judicial notice of the political and social conditions of the area. The federal government had shown no intention of disposing of its public lands, and had permitted a system governing the use of water to grow up by the voluntary act and assent of the people. To be sure, some of the elements were still crude and undigested, but the court noted that a universal sense of necessity and propriety had so firmly fixed other elements of the system that they have come to be looked upon as having the force and effect of res judicata. The plaintiff, being first to use the water, was held to be first in right, and the doctrine of prior appropriation was thus born. It was, of course, conceived by the needs of the arid area, and its character has since been shaped by the local environment in which it has developed.

The principle that he who is first in time is first in right was affirmed in other cases, and became so firmly established that the California court rebuked counsel for disputing its existence. Wherever the matter was litigated in regard to water on public lands, the courts of the west applied the prior rights doctrine. The Supreme Court of Nebraska in Meng v. Coffee, 67 Neb. 500 (1903) explained the genesis of the doctrine as "a crude attempt to preserve order and the general peace, and to settle customary rights among a body of men subject to no law, under which so many and so valuable rights arose that when the law stepped in it was obligated to recognize them".

Mr. Justice Fields had been appointed to the United States Supreme Court from the California Supreme Court, and in Atchison v. Peterson, 87 U.S. (20 Wall.) 507 (1874), the United States Supreme Court, speaking through Mr. Justice Fields, affirmed the prior appropriation doctrine. The court said:

> This equality of right among all the proprietors on the same stream would have been incompatible with any extended diversion of the water by one proprietor, and its conveyance for mining purposes to points from which it could not be restored to the stream. But the government being the sole proprietor of all public lands, whether bordering on streams or otherwise, there was no occasion for the application of the common law doctrine of riparian proprietorship with respect to the waters of those streams. The government, by its silent acquiescence, assented to the general occupation of the public lands for mining, and, to encourage their free and unlimited use for that purpose, reserved such lands as were mineral from sale and the acquisition of title by settlement. And he who first connects his own labor with property thus situated and open to general exploration, does, in natural justice, acquire a better right to its use and enjoyment than others who have not given such labor.

It is interesting to note that though great numbers of people had settled in the west and territorial and state governments had been set up by 1849, no steps were taken by Congress to provide for private acquisition of the federal lands or water. However, a firm system of water law had been formulated by judicial decision, and the fundamental principles then established have ever since been followed consistently. They are: (1) that water in its natural course is the property of the public, and is not subject to private ownership; (2) that a vested right to use the water may be acquired by appropriation and application to beneficial use; (3) that the person first in time is first in right; and (4) that beneficial use is the basis, the measure, and the limit of the right.

By 1862 Congress began to provide ways by which title could be acquired to federal land (Homestead Act, 12 Stat. 392). Conflicts between the riparian land owner and those who desired to remove the water from the channel for use on distant lands developed. In isolated cases the courts were holding in favor of the new riparian land owner. Where the appropriation of water had preceded the land patent, the courts had less difficulty in applying the appropriation doctrine. However, where the water was unappropriated and thus in its accustomed channel at the time of the land patent, the contention that the land owner acquired riparian rights in the water presented a more serious problem. Legislative ratification by Congress of the prior right doctrine was clearly desired. Local customs upholding the appropriation doctrine were first ratified in 1865 in an act concerning federal courts in Nevada (Act of February 27, 1865, ch. 64, 13 Stat. 440). Then, as noted above, Congress in 1866 expressly confirmed acquisition of water rights in accordance with local customs (Act of July 26, 1866, ch. 262 14 Stat. 251). That act simply said that whenever by priority of possession rights to the use of water for mining, agriculture, manufacturing or other purposes have vested and accrued, and the same are recognized and confirmed by local customs, laws and decisions of the courts, the owner of such rights shall be protected in the same.

Then, as also noted above, this Act of 1866 was construed by the U. S. Supreme Court (the 1879 case of Broder v. Water Co., 101 U.S. 274) to be "a voluntary recognition of a pre-existing right of possession constituting a valid claim to" the continued use of the water, rather than "the establishment of a new one," and the courts were bound to protect rights which had vested under local custom, whether initiated prior to or after the passage of that act.

In 1877, with the enactment of the Desert Land Act Congress further aided those states desiring to reject the doctrine of riparian rights by severing the grant of the right to use water from a private patent to public land. After that Act, no United States patent to lands in specifically named western states would carry with it any interest in the water of non-navigable streams. In construing this act, the U. S. Supreme Court said in California Ore. Power Co. v. Beaver Portland Cement Co., 295 U.S. 142 (1935):

> As the owner of the public domain, the government possessed the power to dispose of land and water thereon together, or to dispose of them separately. . . .The fair construction of the provision now under review is that Congress intended to establish the rule that for the future the land should be patented separately; and that all non-navigable waters thereon should be reserved for the use of the public under the laws of the states and territories named.

Thus, the right of each state to adopt its own system of water law to govern the appropriation of non-navigable waters was granted by Congress and confirmed repeatedly by the U. S. Supreme Court. See Nebraska v. Wyoming, 325 U.S. 589 (1945); California Ore. Power Co. v. Beaver Portland Cement Co., supra; Kansas v. Colorado, 206 U.S. 46 (1907); Clark v. Nash, 198 U.S. 361 (1905); U. S. v. Rio Grande Dam & Irr. Co., 174 U.S. 690 (1899). This concept has not been confined to the appropriation states. For example, in Revell v. State, 177 Ill. 468, 52 N.E. 1052 (1898) the same right to establish its own system of water law was asserted by the Illinois Supreme Court. The court said each state has the right to determine for itself the title and rights of riparian owners within its border. Illinois has decided to follow the common law rule of ownership by the sovereign of the beds of navigable rivers with power in the state to prohibit the building of facilities on state land and it applied the common law doctrine of riparian rights.

The federal government, as the proprietor of western land and water, had the right through Congress to dispose of its lands and waters. It was deemed wise by Congress to permit each state to formulate the law controlling its water as best fitted local needs. Agencies of the federal government were required by Congress to comply with state laws in the appropriation of water. For example, the National Reclamation Act of 1902 required the Secretary of the Interior to secure project waters in accordance with local law (Act of June 17, 1902, ch. 1093, §8, 32 Stat. 388). See Nebraska v. Wyoming, 325 U.S. 589 (1945). In California v. United States, 440 U.S. 59 (1978), the U.S. Supreme Court held that the Act was mandatory and meant what it says: The Bureau must acquire water for federal reclamation purposes by complying with state law. However, as we will examine in more detail in future papers, Congress did not relinquish all of its proprietary interests and as a matter of fundamental constitutional law it could not and did not surrender to the states any of its federal governmental powers. As an extension of this concept the Utah Supreme Court in 1954 (In re Bear River Drainage Area, 2 Utah 2d 208, 271 P.2d 846) held that since the Bureau files on water as does any other appropriator, it thereby subjects itself to state administrative procedures and to the jurisdiction of the Utah courts for review of the orders of the State Engineer's administrative orders.

Problems of Regulation

The fact that the federal government was the proprietor of western land and waters probably in the overall end result was beneficial to the states. It may be that the courts would have repudiated the riparian doctrine simply because it was not suitable to western needs. Colorado did so in Coffin v. Left Hand Ditch Co., 6 Colo. 443 (1882). It, however, is entirely possible that the courts would have applied the riparian doctrine had there in the beginning been a riparian owner. If riparian rights had attached to ownership of riparian land, serious constitutional problems would have been encountered in abolishing that doctrine. The development of the west absolutely required the diversion of water from its accustomed channel. It is, thus, fortunate that at the very beginning the federal ownership concept of water developed.

As water needs continue to rise in the eastern portions of the United States and it becomes necessary, in order to meet those needs, to divert water for use on distant lands, these constitutional problems are going to be encountered. The courts in the east thus far have applied the doctrine of riparian rights. If the various riparian land owners acquired rights to the waters in the adjacent streams, the diminution of those rights through diversion for use on distant lands may be halted by the due process clauses of the federal and the various state constitutions. Although we will not digress here to explore this point fully, it ought to be noted in passing that the concept of vested riparian rights should not be considered sacrosanct. They are only a species of property, and private property generally must yield to reasonable police power regulation -- the right to preserve forever the natural yield of a public stream for the exclusive benefit of the owners of riparian lands may ultimately fail. It is failing under the public trust doctrine on western streams. Land owners are losing control of the streams which run through their lands. The state is establishing the right to bring water through private land and the right of the public to use those streams is being expanded throughout the west.

While the federal government, as the proprietor, has acquiesced both through the courts and in Congress in state control of the appropriation of water, the federal government, as a sovereign, has placed many limitations on the concept of state control. It was recognized early on that the federal government received its sovereign powers from the Constitution. These powers could not be increased through the purchase of land from foreign nations. Thus, although France and Mexico, from whom this western land was acquired, followed the civil law, the purchase from these nations did not increase the sovereign powers over these lands of the purchaser (the United States). The Supreme Court has also recognized that where the Constitution excludes the state, Congress cannot re-grant or in any manner reconvey that power to the states. See Cooley v. Board of Wardens, 33 U.S. (12 How.) 299 (1851). Similarly, a state holding title to the bed of a navigable river in trust for the public cannot convey away that trust. See Illinois Cent. R.R. v. Illinois, 146 U.S. 387 (1892) However, where the Constitution grants to Congress the power to legislate, it may discharge its legislative function by adopting state laws, present or prospective. See United States v. Sharpnack, 355 U.S. 286 (1958); Prudential Ins. Co. v. Benjamin, 328 U.S. 408 (1946). It may also remove the obstacles to state legislation which will permit the state itself to legislate directly upon the subject. See Butte City Water Co. v. Baker, 196 U.S. 119 (1905); In re Rahrer, 140 U.S. 545 (1891). But it cannot reconvey its sovereign powers to the several states and it can repeal prospectively any statute it adopts.

Federal Power to Control Navigation

One of the main restrictions on state control of the appropriation of water is the power of Congress to regulate commerce and to control navigable waters. The Supreme Court has said that the federal government holds a "dominant servitude" on the waters of navigable stream. If it chooses to exercise its full powers, private rights initiated under state law to use the navigable waters apparently can be totally wiped out without compensation.

United States v. Twin City Power Co., 350 U.S. 222 (1956), involved the problem of just compensation for a potential power site taken by the United States. Congress had authorized construction of a multiple-purpose dam, one of the uses being to improve the river for navigation. The court held that the United States need not compensate the owner of the power site, and in so holding stated:

> The interest of the United States in the flow of a navigable stream originates in the commerce clause. That clause speaks in terms of power, not of property. But the power is a dominant one which can be asserted to the exclusion of any competing or conflicting one. The power is a privilege which we have called "a dominant servitude" [citing cases] or "a superior navigation easement". . . .The legislative history and construction of particular enactments may lead to the conclusion that Congress exercised less than its constitutional power, fell short of appropriating the flow of the river to the public domain, and provided that private rights existing under state law should be compensable or otherwise recognized. Such were U. S. v. Gerlach Live Stock Co., 339 U.S. 725 and Federal Power Commission v. Niagara Mohawk Power Corp., 347 U.S. 239 (1954). We have a different situation here. One where the United States displaces all competing interests and appropriates the entire flow of the river for the declared public purpose.
>
> . . .[T]he exclusion of riparian owners from the benefits of the power in a navigable stream "Without compensation is entirely within the Government's discretion."

The absolute power over navigable waters thus conceded to Congress by the Supreme Court is a matter of considerable importance. All navigable waters are fed by tributaries, which in their upper reaches are non-navigable. Still the diversion and consumptive use of such waters can deplete the flow and thus interfere with navigation. This also is the basis for the exercise of federal control. It is, for example, used to control sewage and industrial waste dispersed into navigable streams.

Also, the question of whether the purpose of a project is in fact for navigation is left to Congress. In the case of Arizona v. California, 283 U.S. 423 (1931), Arizona charged that the Secretary of the Interior was proceeding in violation of Arizona's quasi-sovereign rights to build Boulder Dam. Half of the dam was to be located in Arizona. Its purpose was to divert water from the Colorado River. The Supreme Court held that the federal government had the power to authorize construction of the dam for the purpose of improving navigation. To the contention of Arizona that the purpose of the dam was really other than improving navigation, the Court said:

> Into the motives which induced members of Congress to enact the Boulder Canyon Project Act, this Court may not inquire. . . .The Act declares that authority to construct the dam and reservoir is conferred, among other things, for the purpose of "improving navigation and regulating the flow of the river." As the river is navigable and the means which the Act provides are not unrelated to the control of navigation. . .the erection and maintenance of such dam and reservoir are clearly within the powers conferred upon Congress. Whether the particular structures proposed are reasonably necessary, is not for this Court to determine.

It is of some interest to note that the several states involved, with the consent of Congress had in 1922 adopted the Colorado River Compact. Under article IV of that compact it was recited, "that the Colorado River has ceased to be navigable for commerce, and that the use of water for purposes of navigation shall be sub-servient to the use of water for domestic, agriculture and power purposes." Congress had concurred in that compact. Notwithstanding this declaration that the river had ceased to be navigable and that navigation should be sub-servient, the authority to build the dam was, as noted above, upheld and the motives of Congress were held to not be for the court. That doctrine was re-affirmed in First Iowa Hydro-Electric Co-op v. FPC, 328 U.S. 152 (1946).

If the various federal legislative grants of the right to appropriate water in accordance with the state law are subordinated to the sovereign power to control navigable waters, and if the sovereign power can be exercised without compensation, what rights initiated under state law can be secure? No one would quarrel with the principle of superior federal control in regard to navigation. The power is one which by its nature must be federal, but its exercise need not wipe out private rights without compensation.

Logically, the federal statutes confirming local custom and permitting appropriations under state law should be construed as a consent by the proprietary owner to the initiation of private rights. Where private rights have been initiated in accordance with the requirements of the applicable law, the rights ought to be protected. In disposing of its public lands, the federal government has long recognized that the various land statutes constitute an offer to the public of the right of entry. For example, when mining claims are located in accordance with controlling statutes, rights are initiated and subsequent withdrawal of the land for governmental purposes cannot cancel those rights without compensation. Such has been the uniform holding of our courts. See Lindley, Mines §539 (3d ed. 1914).

The same principle is applied to entries under the Homestead Act and the Desert Land Act. Even though the fee title is still in the United States, and much work must yet be done before a patent may be applied for, the mere initiation of the right is recognized as a species of property entitled to the protection of the due process clause. If the federal statute permitting the appropriation under state law were intended to mean that appropriations made thereunder are sub-servient and junior to the rights of the federal government to the same water for navigation, the statutes ought to be changed. Diversion of water for use on distant land is expensive. Often the efforts of a lifetime, even of generations, have been invested in building facilities in reliance on appropriations of water initiated under state law. The Government itself has been vitally concerned in having resources developed, and past federal water statutes have been calculated to lend encouragement to those efforts. Without regard to technical questions of where the ultimate power resides, as between the federal government and the state, practical considerations require the development of a system of law upon which the appropriator may rely. He must be assured that the investment he makes to develop the resources will not be wiped out without compensation by some dominant federal power.

The protection of these rights is not without precedent. In regard to the use of the surface of federal lands, permits have been issued for grazing. The permits generally fall into two classes, one governing the use of forest lands and the other under the Taylor Grazing Acts, relating to the use of winter range. Congress, in providing for the issuance of permits, has expressly recited that the permittee has no vested right in the land. The courts have uniformly held that when the lands are needed for governmental purposes, the permits may be revoked and the Government has no legal duty to compensate the permitee. See United States v. Cox, 190 F.2d 293 (10th Cir.), cert. denied, 342 U.S. 867 (1951); Osborne v. U. S., 145 F.2d 892 (9th Cir. 1944). Still, when use of the lands became necessary for military purposes, Congress expressly provided that:

> Whenever use for war or national defense purposes of the public domain. . .prevents its use for grazing, persons holding grazing permits or licenses and persons whose grazing permits or licenses have been or will be canceled because of such use shall be paid out of the funds appropriated or allocated for such project such amounts as the head of the department or agency so using the lands shall determine to be fair and reasonable for the losses suffered by such persons. . . . (43 U.S.C. §315(q) (1942))

Even in the navigation field compensation has been allowed to the holder of the private rights because Congress had not elected to assert its full dominant power. FPC v. Niagara Mohawk Power Corp., 347 U.S. 239 (1954); U. S. v. Gerlach Live Stock Co., 339 U.S. 725 (1950). In the Gerlach case the Court said:

> . . .[T]hat Friant Dam in fact bears some relation to control of navigation, we think nevertheless that Congress realistically elected to treat it as a reclamation project. . . .Whether Congress could have chosen to take claimant's rights by the exercise of its dominant navigation servitude is immaterial [because it didn't elect to do so here].

And in the Niagara Mohawk case, the Court said:

> We conclude, as did the Court of Appeals, that even though respondent's water rights are of a kind that is within the scope of the Government's dominant servitude, the Government has not exercised its power to abolish them.

In another case relating to the licensing of pilots on navigable streams (Cooley v. Board of Wardens, 53 U.S. (12 How.) 299 (1851)), the Supreme Court upheld the power of Congress to require pilots to comply with state law. The court noted that until it became necessary for Congress to exert its power,

> . . .it should be left to the legislation of the States; that it is local and not national; that it is likely to be the best provided for, not by one system, or plan of regulations, but by as many as the legislative discretion of the several States should deem applicable to the local peculiarities of the ports within their limits.

Thus, even if the navigation servitude is dominant, it need not as a matter of policy be exercised to its full extent.

The Indian Water Rights

Insofar as the power to protect water for the Indians is concerned, again I believe that the power is and should be federal. At the time most Indian tribes were placed on reservations, they had not developed agricultural skills to a point where full use of water resources was made. Individually they lacked the educational qualifications to equip them to comply with state law on appropriation of water. In most instances the water flowing across the public lands and into and out of the reservations was unappropriated. The courts simply held that Congress, in creating the reservations, had intended to reserve both the land and the water. The Government, we must again note, was the proprietor. By its Acts of 1866 and 1877 it had offered the waters to the public, but as to the unappropriated waters the offer had not yet been accepted. The congressional power which could make the offer likewise could rescind it before acceptance. The creation of the reservations did this, and waters thus withdrawn with the lands were no longer offered by the proprietor for public entry. Instead, there was reserved to the Indian tribes the water presently needed for their reservations, and also the water which they might reasonably need in the future. No other holding would be moral insofar as the Indians are concerned, and theoretically the power of the proprietary owner to withdraw the unaccepted offer and the power of the sovereign to provide for the Indians can hardly be challenged. See U. S. v. Ahtanum Irr. Dist., 236 F.2d 321 (9th Cir. 1956); U. S. v. Walker River Irr. Dist., 104 F.2d 334 (9th Cir. 1939); Winters v. U. S., 143 Fed. 740 (9th Cir. 1906), aff'd 207 U.S. 564 (1908); U.S. v. Conrad Inv. Co., 156 Fed. 123 (D. Mont. 1907), aff'd, 161 Fed. 829 (9th Cir. 1908).

The Property Clauses

In the FPC v. Oregon, 349 U.S. 435 (1955), commonly called the Pelton case, the fact that the federal project was in part on Indian lands and in part within a power reserve were used as a basis for exclusive federal control and non-compliance with the laws of the state of Oregon. The Federal Power Commission had licensed the construction of a dam on an non-navigable stream solely for the generation of power with no consumptive use of the water. The power was not for the use of the Indians and the theory of the earlier cases on Indian rights would not work. The state of Oregon protested because of alleged interference with fish and because of non-compliance with Oregon laws.

The Supreme Court held that the matter was exclusively federal and no compliance with state law was necessary. The power was said to reside in the property clause which authorizes Congress to dispose of federal property. The Desert Land Act and other federal water statutes were held to be inapplicable. The Indian reservation had been created prior to the enactment of the Desert Land Act. The Desert Land Act was intended to apply only to "public lands," and the Court held that lands in an Indian reservation were no longer public lands. The power withdrawal, however, had occurred about 1910, long after the date of the Desert Land Act. The problem was to determine whether Congress, by creating the procedure for withdrawing lands for power purposes, had intended to have the withdrawal also withdraw the unappropriated water. If the power withdrawal was intended to constitute a withdrawal of the unappropriated water, then there is nothing wrong with the holding. But if Congress, by permitting the withdrawal of the land, had not intended the land withdrawal of the water, then the various federal water statutes should control and federal agencies should have been required to comply with the state law to get the water for the power project. Thus, the holding of the Supreme Court in the Pelton case is that the subsequent withdrawal of federal lands for power purposes impliedly superseded the Desert Land Act. Mr. Justice Douglas dissented because he did not think that such was the congressional intent.

While there is no theoretical reason why Congress, in exercising the power of the proprietor under the property clauses of the Constitution, cannot withdraw its offer of unappropriated waters and remove the same from state control, still such a far-reaching change of policy ought not to rest on implication. If such is the intent of Congress in providing machinery for withdrawal of land for various federal purposes, that intent ought to be express.

On June 23, 1958, the United States Supreme Court decided four cases which in the language of the court presented "issues of basic importance to Federal Reclamation laws." The cases are known generally as the Ivanhoe cases (Ivanhoe Irr. Dist. v. McCracken, 357 U.S. 275). In these cases the Supreme Court of California had refused to confirm certain contracts between two state irrigation districts and a water agency on the one hand and the United States on the other (47 Cal.2d 597 (1957)). The California court found the contracts invalid on several grounds. The dominant power of the federal government in regard to the management and disposal of federal property was again pronounced. On appeal, the U. S. Supreme Court said:

> In developing these projects the United States is expending federal funds and acquiring federal property for a valid public and national purpose, the promotion of agriculture. This power flows not only from the General Welfare Clause of Art. I, Section 8 of the Constitution, but also from Art. IV, Section 3, relating to the management and disposal of federal property. As this Court said in United States v. San Francisco, 310 U.S. 16, 29-30 (1940), this "power over the public land thus entrusted to Congress is without limitations. And it is not for the courts to say how that trust shall be administered. That is for Congress to determine."
>
> Also beyond challenge is the power of the Federal Government to impose reasonable conditions on the use of federal funds, federal property and federal privileges. [cases cited] The lesson of these cases is that the Federal Government may establish and impose reasonable conditions relevant to federal interest in the project and to the over-all objectives thereof. Conversely, a State cannot compel use of federal property on terms other than those prescribed or authorized by Congress. Public Utilities Commission of California v. United States, 335 U.S. 534 (1938). Article VI of the Constitution, of course forbids state encroachment on the supremacy of federal legislative action. (357 U.S. at 294-95) (emphasis added)

Other Dominant Federal Powers

Article VI of the United States Constitution expressly provides that:

> This Constitution, and the Laws of the United States which shall be made in Pursuance thereof; and all Treaties made, or which shall be made, under the Authority of the United States shall be the supreme Law of the Land; and the Judges in every State shall be bound thereby, any Thing in the Constitution or Laws of any State to the Contrary notwithstanding.

As was noted by the U.S. Supreme Court in the above quotation from the Ivanhoe cases, "state encroachment on the supremacy of federal legislative actions" is forbidden. It must be assumed under this language that any treaty made by the United States concerning the use of waters of international streams would be binding upon the several states. So also might the power of the federal government to provide for the defense needs of the country. This was suggested in the case of U. S. v. Public Util. Comm'n, 141 F. Supp. 168 (N.D. Calif. 1956), aff'd, 355 U.S. 534 (1958). This controversy arose over the constitutionality of a California statute which provided that the state Public Utilities Commission might permit common carriers to transport property for the United States at reduced rates "to such extent and subject to such conditions as it may consider just and reasonable." The right of the military to contract freely with privately owned carriers was asserted. A three-judge court held the statute to be unconstitutional, on the grounds that the State of California could not regulate the federal government in the performance by it of its functions.

In a case decided August 27, 1958, a district court held that the federal government did not need to procure from the State Engineer for the State of Nevada a permit to drill wells on reserved lands constituting the Hawthorns Naval Ammunition Depot. Nevada ex rel Shamberger v. U. S., 167 F. Supp. 600 (D. Nev. 1958).

In 1960 I delivered a papers to the Western Resources Conference in Denver on Resource Development. My paper was entitled "Conflicts Between the Upper and Lower Basins on the Colorado River". I there noted:

> It must always be remembered that the Federal Government originally had a dual interest in the river. The first was a role of a sovereign, exercising the various powers granted to it by the Constitution (power to regulate commerce, art. I, sec. 8; the war power, art. I, sec. 8; the general welfare clause, art. I, sec. 8; treaty power, art. VI). The second involved the rights of a proprietary owner of Western lands and the waters arising on them. The sovereign powers granted to the Federal Government by the Constitution could not as a matter of constitutional law have been reconveyed by Congress to the several states (Cooley v. Board of Wardens, 53 U.S. (12 How.) 299 (1851)), and the signing of the compact did not, in any event, purport to have that effect. Thus, problems which were of local concern and therefore were left at the time of the compact to local state action can at some future time become of national concern justifying national regulation.
>
> As is noted by Messrs. Frankfurter and Landis:
>
> > ". . . In a zone for legislation open both to Congress and the States, the controlling facts justify, at least for the time being, co-operative State adjustment. Congress does not surrender any of its powers; it merely finds no occasion for its present exercise of them. There is, therefore, no 'delegation' of its power in any legally significant use of the term. But Congress does not foreclose the future. If and when circumstances which now call for solution through compact change, Congress is wholly free to assume control. . ." ("The Compact Clause of the Constitution -- A Study in Interstate Adjustments", 34 Yale Law Journal 685 (1925))

I then proceeded to discuss the disputes in the Lower Basin between Arizona and California in regard to the division of the Lower Basin water among the Lower Basin states. I noted that some problems in connection with the river development are local, some are regional and some are national, but that if the states should fail to reach an agreement and thus leave a void, "certainly Congress will have the power" under the ever-expanding concept of the commerce clause to re-enter the field by direct legislation. Because Congress may legislate directly in regard to many of the future problems arising both between the Upper and Lower Basins and between states within either basin, we simply cannot assume that the compact has solved all problems, nor that the states will be left free to settle their differences. This proved to be prophetic. Arizona and California were not able to resolve their differences and again went to the U. S. Supreme Court for a division of the water. In 1963, the court held that Congress had the power to allocate the water of an interstate stream among the affected states and that by adopting the Boulder Canyon Project Act in 1928, Congress had done precisely that. See Arizona v. California, 373 U.S. 546 (1963).

I was personally troubled with the decision because I had been following the allocation of water among the Colorado Basin states for many years and I do not know of anyone who was of the opinion that Congress had undertaken in 1928 to deal with that problem. It was such an important matter that one would have to assume that if Congress were intending to make the interstate allocation among Nevada, Arizona and California, that intention would have been expressed in the Boulder Canyon Project Act and would have been reflected in the Congressional debates. It is far too important to the states involved to have simply been enacted without debate. Three justices dissented, not because they doubted the power of Congress to exclude the states, but because they did not think Congress had intended to do so. One of the justices noted that there was a "pervasive hostility" among westerners to federal control of water rights in any form. He also noted that when it was suggested that Congress might legislate in this area, a storm of doubt arose as to the constitutional power of Congress to do so. The states had unsuccessfully responded by asserting that the only constitutional methods of apportioning the river were by a suit among the states in the U. S. Supreme Court, or by an interstate compact. A dissenting justice, Mr. Justice Harlan, stated that he saw no constitutional objection to a legislative apportionment of the water, but did not think Congress had intended to do so, and neither do I. He said:

> When plans for development of the Lower Basin threatened the rights of the upper States, they did not seek the simple (and in my view constitutionally unobjectionable) solution of a legislative apportionment. They employed instead the cumbersome method of interstate compact, which required authorization by Congress and by seven state legislatures prior to negotiation and ratification by the same eight bodies thereafter. When it began to appear that Arizona would not ratify the compact, Congress still did not legislate a general apportionment. . . .
>
> It is utterly incredible that a Congress unwilling because of concern for States' rights even to limit California's maximum consumption to 4,400,000 acre-feet without the consent of her legislature, intended to give the Secretary of Interior authority without California's consent to reduce her share even below that quantity in a shortage.

He concluded that Congress throughout the dispute had exhibited great reluctance to interfere with the division of the water by direct legislative action and that this was because of a deep and fundamental mistrust by the states of federal intervention and a profound regard by Congress for state sovereignty. Thus, when Congress was forced to legislate with respect to the problem, or face defeat of the project, it chose narrow terms appropriate to the narrow problems before it, and even then "acted only indirectly to require California's consent to limiting her consumption." He concluded that it is inconceivable that such a Congress intended that the sweeping federal power which it had declined to exercise itself would be exercised at the unbridled discretion of an administrative officer.

Mr. Justice Douglas, in his dissenting opinion, noted that the question is not what Congress has the authority to do but rather the kind of regime under which Congress has built this and other irrigation systems in the West. "Heretofore those regimes have been posited on the theory that state law determines the allotment of waters coming through the irrigation canals that are fed by federal dams." He noted that the property right in the water right is separate and distinct from the property right in the reservoirs, ditches or canals. He characterized the majority opinion as a bald "attempt by judges. . .to spin their own philosophy into the fabric of the law, in derogation of the will of the legislature."

Nevertheless, it is now established law that Congress can still legislate to solve these interstate stream problems. It did so again in adopting filling criteria for Lake Powell. More recently in Sporhase, et al v. Nebraska, ex rel Douglas, Attorney General, 458 U.S. 941, the court noted that in an underground basin which intruded into several states, Congress does have the power to allocate the water and to regulate its use. This statement, which was not necessary to the decision, has caused great concern in the western states. However, it is consistent with what I have always believed the law to be.

The federal government originally was the proprietary owner of the land and the water. This has been established by a long line of decisions, and is perhaps best reflected by the following quotation from Alabama v. Texas, supra:

> "'For it must be borne in mind that Congress not only has a legislative power over the public domain, but it also exercises the powers of the proprietor therein. Congress 'may deal with such lands precisely as an ordinary individual may deal with farming property. It may sell or withhold them from sale.' [citing cases] "Article 4, Section 3, Cl. 2 of the Constitution provides that 'The Congress shall have Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States.' The power over the public land thus entrusted to Congress is without limitations. 'And it is not for the courts to say how that trust shall be administered. That is for Congress to determine.' United States v. California, 332 U.S. 19, 27, 67 S.Ct. 1658, 1663, 91 L.Ed. 1889: "We have said that the constitutional power of Congress [under Article IV, §3, Cl. 2] is without limitation. United States v. City and County of San Francisco, 310 U.S. 16, 29, 30, 60 S.Ct. 749, 757, 84 L.Ed. 1050."

Under the United States Constitution, Congress is thus given the authority over federal property, under the clause which is commonly known as the property clause. Congress initially acquiesced in the squatters settling in the west and using the federal land and water. Then in 1866, Congress expressly authorized the acquisition of ownership of mining properties and water rights through compliance with state or local law and local customs. Where a private individual has followed local law and perfected a water right, it is a property right protected by the U. S. Constitution and it cannot be taken without compensation. The Ninth Circuit Court of Appeals expressly so held in Hunter v, United States, 388 F.2d. 148 (C.A. 9 Cal., 1967).

However, where there is unappropriated water which originates on the public land, the United States, through Congress, can withdraw the unappropriated water and thereby prohibit new appropriations. The court has implied such a congressional intent under numerous circumstances where federal land has been set aside for special use. The initial reservation was confirmed in 1907 in the case of Winters v. United States, supra, where an Indian reservation was held also to reserve Indian water. The court has since extended this reservation doctrine to many other situations and it has become known as the federal reserved rights doctrine.

In addition to its rights as a proprietary owner, the United States has numerous sovereign powers as a federal government. It has the power to control the waters of navigable streams under the commerce clause and it exercises this power as a basis for federal legislation in many areas, such as the basis for clean water legislation. It has powers under the property clause to manage waters on federal lands, such as Fort Douglas, where the government built Red Butte Reservoir without a state permit and on the U. S. Forest where the federal government built Mill Creek Reservoir without a state permit. It is used to regulate navigation. This was the basis for the power to build Boulder

Dam over Arizona's objection that the project had no state water permit. It is used to drill wells on lands withdrawn for a military base, again without a state permit, etc. Congress also has the power to provide for the general welfare and could legislate in this area for the health, welfare and safety of the people. Congress also has the power to control projects built with federal funds.

Thus, the federal government does have powers, both as a proprietary owner and as a government, over much of the water in the west. In the case of the Bureau of Reclamation, in 1902 Congress provided that the Secretary of the Interior would secure water for its projects through filings made under state law and the U. S. Supreme Court in a fairly recent decision, California v. United States, 440 U.S. 59, (1978), held that the mandates of the statute were controlling on the Bureau, and that even though, as a matter of basic power, the federal government may have proceeded without a state permit, Congress had provided otherwise. We thus have a state-federal partnership and we have on many streams state and federal systems co-existing, but generally speaking, the federal government has deferred to the states permitting each state to adopt its own system for allocating water.

In the east, where rainfall is generally adequate to mature crops, and where there is little public land, the states have followed the law of England with private rights to use the waters of the stream being dependent upon the ownership of land adjacent to the stream. In England the basic value of water was in the use of the stream for power purposes and the use of the water for transportation. The law which developed was, therefore, calculated to keep the water in the stream. This system would never have worked in the west. Our economy absolutely required that we divert water from its accustomed channel to irrigate our desert land, to mine our minerals and develop our industries. If we had confined water use to the lands abutting a stream, we would still be known as the Great American Desert.

In the Sporhase case, supra, the Supreme Court reviewed the history of water development and recognized expressly that Congress for over 100 years has generally deferred to the states. Still, it has the power to change. It was and is my opinion that western water problems are mostly local and that a statute trying to provide uniformity over the entire nation, or for that matter, even over the entire west, would not work as well as local statutes addressing local problems.

Federal and Local Problems

It must be recognized that in the very nature of the problem there must be some dual control. Obstacles constructed across navigable streams have to be regulated if navigability is to be protected, and such construction can hardly be left to the control of the individual state. The licensing and regulation of such structures is in fact a federal problem, and in any event is placed under the control of Congress by the Constitution. Yet, the power to regulate and license such structures does not need also to embrace control over the appropriation of project water. The use of water from a stream ought to be administered under a single system insofar as this is possible. Users of water above and below the licensed dam will have initiated their rights under state law. It will in no way interfere with the federal government's power to protect the navigability of streams to first require the procurement of a federal license, and then to require the securing of project water in accordance with state law, as was provided for reclamation projects by the National Reclamation Act. If this were done, the agencies created by Congress could prohibit the obstruction of navigable streams, except under federal license, but the use of water would be fitted into the state priority system in existence above and below the licensed dam.

That problem is complicated in some areas by the fact that the river in question may be the boundary between two states, or more, with different rules of appropriation. It might also be an interstate stream which originates in one state and flows into another. But theoretically this problem is solved by the fact that each state is entitled only to its equitable share of such a stream, and the total rights initiated under the laws of one state may not exceed that state's equitable share of all the water. Hinderlider v. LaPlata River and Cherry Creek Ditch Co., 304 U.S. 92 (1938).

One further problem in these cases develops after the conclusion is reached that Congress has withdrawn the water. For example, in the Indian cases, it is not enough to hold that Congress by implication withdrew the water. This merely gets it back in federal control. To get the water to the Indians, Congress must act in some fashion to grant to the Indians the right of use. This also must rest on implication in some cases. Where the Indians use the water of the same stream from which other users divert under state law, the administration of these rights on a priority, or any other basis, will inevitably bring conflicts. The quantity of water available for the Indians must be given some type of a priority, and the water of the stream must be divided upon some basis during periods of low flow and in times of shortage. In the Pelton case the water of the stream in question was going to be used for power purposes. The Supreme Court concluded that Congress had granted to the Federal Power Commission the right to license the use of the water under section 4 of the Federal Power Act, which provided that the Commission could issue a license "for a power project to use waters on land constituting reservations of the United States located in Oregon." It isn't at all clear what these waters consisted of, what the extent of the grant was intended to be, or how it fitted into the state priority system, except that vested rights of others were supposed to be protected.

Water rights granted under such a project may or may not be fitted into the state priority system. In the Pelton case the water use was non-consumptive, and a lower regulating dam made it possible to feed the water downstream in an even flow, rather than in surges, as needed for power purposes. But the principle of law there stated would permit Congress, under the property clause, to withdraw other unappropriated waters and to grant the right of use to other projects, where such protection may not exist. If such is done, conflicts will arise between that project and rights initiated under state law. It would permit a much more orderly administration if the federal agencies were to license and control the operation and construction of facilities which might interfere with navigation, and the water were appropriated under the existing state system, as was expressly required in the National Reclamation Act. No particular difficulty has been encountered from this requirement in more than 80 years of reclamation projects.

Perhaps one other problem ought to be noted in this discussion of power. On non-navigable streams, where the federal government has permitted acquisition of private rights in accordance with state law, these rights are vested and should be protected by the due process clause of the Constitution. On navigable streams, where rights have been initiated under state law, may the same rule apply, or are such rights subject to the dominant power of the federal sovereign to provide for and protect navigation? If this dominant power can wipe out rights initiated under state law on navigable streams, how far upstream can the dominant power run? The depletion of stream flow by diversion and consumptive use could interfere with navigation, even though the diversion may be from a non-navigable tributary. The dominant power really ought not to be extended so far. The federal government, under the property clause in the Constitution, may dispose of federal property. This is a right without limitation. (See the above quote from Alabama v. Texas, supra). From the Supreme Court opinions it would appear that the federal government owns the unappropriated waters of both navigable and non-navigable streams flowing through public lands. If under the property clause Congress elects to offer the waters to the public, and the offer is accepted by the initiation of private rights of use, there isn't any theoretic reason why these rights also should not be protected by the due process clause. Then if Congress thereafter elects to exercise its sovereign power over the waters of a navigable stream, the United States should pay just compensation for injury to private vested rights. The power to regulate commerce does not require the federal government to prohibit all obstructions to commerce, nor to exercise its full powers as a sovereign to negate private rights it has granted as a proprietary owner.

Resolution of Conflict Between Federal and State Power

In the last analysis, however, the matter ought to be resolved as a matter of policy -- not of power. Even if the dominant servitude for navigation could wipe out all private rights, as a matter of theory, it should not be exercised to that full extent as a matter of policy. Rights initiated in accordance with the federal offer ought to be protected. If thereafter it is necessary to take the rights for public use, compensation should be paid therefor.

The federal government itself ought to be and is vitally concerned with the development of the west. It is easy to forget that there was once written across the old maps of the west the legend "Great American Desert." The settlers have built an empire from the desert. The whole economy of the west is dependent upon its water resources. The people have been encouraged by the federal government to so build, and the great western water resources should all be put to use. A doctrine which will encourage the continued appropriation and use of the unappropriated waters is in the common interest of all, although there is a growing concern for protection also of the public interest in such things as minimum stream flows and environmental values in live streams. Waters readily available have long since been appropriated. Unappropriated water can only be diverted and put to use at great expense. If, under the various federal sovereign powers, rights so initiated are to be taken without compensation, there is little encouragement to future development. The federal government has in the past encouraged the development of oil and gas through liberal tax and leasing laws. Procedures for acquiring mining claims, homesteads, desert entries, etc., have been calculated as a matter of policy to encourage development. The western lands cannot be developed without water, and a protective policy which will encourage the expenditures necessary to appropriate the water and develop the land must evolve. Because the problems incident to the use of water are local in character, the law governing the use of water should be developed on a local level.

We will next examine state appropriation procedures.

The **Chairman**. Mr. Clyde, we are indebted to you for your testimony this time, for your written statement, and indeed for your testimony in previous versions of coal slurry pipeline legislation.

I am glad that you endorse unequivocally this legislation with respect to its water language. Indeed, the water language was drawn at the insistence of Senator Wallop in accordance with your testimony previously. And I am glad we faithfully carried that out and achieved what you said was necessary. And we have done it well.

You are, if not the preeminent water expert in the Nation—I don't know anybody else who is ahead of you in that respect. So, for you to endorse this is very helpful to us.

Thank you also very much, Mr. Braca, for your testimony. I am especially interested in many of these technologies being able to burn the coal slurry directly without dewatering.

You mentioned that they could be stored in tanks just as oil. My quick question is, will not some of the water drain out. Will not the slurry settle down and be less than the 30 percent water if you put it in large storage tanks?

Mr. **Braca**. Well, the slurry is designed—call it coal-water fuel rather than slurry—is designed by the means of adjusting the particle size distribution—we call it a bimodal system—and the use of dispersants. And some of our American competitors who have similar technologies use stabilizers as well.

We have kept the Russian coal in storage tanks up to six months without having it settle out. But the target is to have it in there at least one month.

Now, if there is a tendency to settle out, then we would use mixes in the tank.

The **Chairman**. You don't want it to settle out.

Mr. **Braca**. We don't want it to settle out, certainly not.

The **Chairman**. I see.

Senator Wallop?

Thank you very much, gentlemen.

Senator **Wallop** [presiding]. I would just say that I was intrigued and considerably excited by the technology that you spoke of, Mr. Braca.

Mr. Clyde, one, I am glad to see you again. And two, I think the point you make about Sporhase should not be lost on Western States. I thought that was the most alarming part of that Supreme Court decision. And I also noted that in that decision, as you point out, that the Court said that the State could devise the means by which—if it were authorized by Congress, that it was Congress' silence on the issue that had, in fact, led them to the decision that they made. It was not a constitutional question. By speaking to that, I think it is very important.

Now, there is a vote, and I noticed that there are no other witnesses scheduled to appear before the committee.

There are two letters for the record: one from the National Association of Regulatory Utility Commissioners, and one from the Environmental Policy Institute.*

I thank you all. The committee stands adjourned.

[Whereupon, at 12:45 p.m., the hearing was adjourned.]

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*See appendix.

APPENDIX

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

National Association of Regulatory Utility Commissioners
Incorporated

PETER A. BRADFORD *President*
New York Public Service Commission
Empire State Plaza
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BRUCE HAGEN *First Vice President*
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PAUL RODGERS
Administrative Director
General Counsel

GAILE ARGIRO
Treasurer

September 4, 1987

The Honorable J. Bennett Johnston
Chairman
Committee on Energy and Natural Resources
United States Senate
Dirksen Senate Office Building Room 362
Washington, D.C. 20510

Re: NARUC Testimony on S. 801

Dear Chairman Johnston:

The National Association of Regulatory Utility Commissioners (NARUC) respectfully requests that this letter be included in the hearing record on S. 801, the "Coal Distribution and Utilization Act of 1987."

As the Association representing the State Commissions responsible for the economic regulation of our Nation's electric utilities, we have a vital and direct interest in the transportation of coal -- an energy resource which currently accounts for well over fifty percent of our Nation's electric generation.

At its Summer Meeting in Seattle, Washington, in July of 1982, the NARUC Executive Committee endorsed the concept of granting the Federal power of eminent domain to interstate coal pipeline systems in order to facilitate the national distribution and utilization of domestic coal. This position still holds.

It is our view that the development of coal-slurry pipelines is in the National interest. Such pipelines would add a much needed element of competition to the transportation of coal, increased access to coal supplies on the part of utilities and increased access to markets on the part of coal producers. Pipeline transportation has also proven to be one of the safest and most economical means of fuel distribution.

Most importantly, we firmly believe that increased competition in coal transportation would reduce electric utility fuel costs and thereby provide significant benefits to utility ratepayers. This position is consistent with our support for proposed legislation which would amend the Staggers Rail Act to provide for more equitable regulatory review of rates for captive coal shippers. It is also consistent with our support for Federally-supported research, development and demonstration of clean coal technologies. In our view, coal will continue to be an attractive and dominant boiler fuel -- especially if the new technologies live up to their promise -- and its transportation should be as competitive as possible to ensure the maximum benefit to the Nation's ratepayers.

We are extremely pleased that S. 801 respects the primacy of State water law and the jurisdiction of State Public Utility Commissions. We are therefore pleased to support the bill now before you and urge its timely enactment.

Thank you for allowing us an opportunity to participate in this important debate.

Respectfully yours,

Paul Rodgers,
General Counsel

John Flumerfelt,
Director of Congressional
Relations

cc: Hon. Edwyna G. Anderson, Chair
NARUC Committee on Electricity

ENVIRONMENTAL POLICY INSTITUTE

September 10, 1987

Senator Bennett Johnston
Chairman
Senate Committee on Energy & Natural Resources
Washinton, D.C. 20510

Dear Mr. Chairman:

The Environmental Policy Institute wishes to submit this letter for the hearing record on coal slurry pipeline legislation, S. 801. The Environmental Policy Institute has worked for over twelve years on coal slurry pipeline issues and brought to the attention of the Congress many significant problems with such pipelines. Despite our strong interest in the serious energy, water, agricultural and transportation questions surrounding coal slurry pipelines, we were not invited to participate in the Committee's hearing today.

The Environmental Policy Institute requests that no action be taken on S. 801 until all interested parties are heard on this matter. The many new members of the Committee deserve the opportunity to hear some of the reasons why Congress did not approve coal slurry pipeline legislation in previous sessions. One hearing, we believe, is not sufficient to begin to grapple with an issue that occupied the attention of earlier Congresses for some time.

Sincerely,

Brent Blackwelder
Brent Blackwelder
Vice President

Mike Clark
Michael Clark
President

American Farm Bureau Federation

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September 25, 1987

Ms. Patricia Benneke, Senior Counsel
Senate Committee on Energy and Natural Resources
362 Dirksen Building
Washington, DC 20510

Dear Ms. Benneke:

I am enclosing a statement concerning S. 801, the "Coal Distribution and Utilization Act of 1987," which we would appreciate having included in the official record of the hearings.

Thank you for your courtesy in this matter.

Sincerely,

John C. Datt
Executive Director
Washington Office

JCD/laf

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STATEMENT OF THE AMERICAN FARM BUREAU FEDERATION
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
REGARDING S. 801, "COAL DISTRIBUTION AND UTILIZATION ACT OF 1987"

September 25, 1987

American Farm Bureau Federation
Washington Office — 600 Maryland Ave., SW, Washington, DC 20024. Phone: (202) 484-2222

STATEMENT OF THE AMERICAN FARM BUREAU FEDERATION
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
REGARDING S. 801, "COAL DISTRIBUTION AND UTILIZATION ACT OF 1987"

September 25, 1987

The American Farm Bureau Federation is pleased to comment on S. 801, "Coal Distribution and Utilization Act of 1987."

Farm Bureau is the nation's largest general farm organization representing more than 3.5 million families in 49 states and Puerto Rico.

As you know, Mr. Chairman, Farm Bureau has testified many times before on the subject of coal slurry pipeline legislation. S. 801 is very similar to those earlier failed legislative proposals. Our statement today will reiterate some of what we said in earlier testimony. The stated purpose of the legislation is to facilitate the development of coal pipelines by granting the federal power of eminent domain to those coal pipelines that are determined to be in the national interest.

Farm Bureau policy, as reflected by a resolution adopted last January at our annual meeting in Anaheim, California, states that, "We oppose legislation which grants the right of federal eminent domain to any additional entities." Under the terms of the pending legislation, coal slurry pipeline companies--which are privately-owned businesses--would be given the authority to exercise the federal right of eminent domain and take whatever property they need to build their pipelines. Most of the land taken from private citizens will obviously be in rural areas. Granting federal eminent domain authority to coal slurry developers will disrupt thousands of acres of land across thousands of miles now being used by agriculture.

Our policy also states that "the taking of property or easements from property owners should be permitted only when there is a clear-cut need for the betterment of the public good." Generally speaking, the right of eminent domain should be granted only in cases of public necessity or when an overwhelming public good would be accomplished.

Given the alternative modes of transportation currently available, there is no need for coal slurry pipelines. The development of the coal slurry pipeline proposal so far would not result in the production of new coal. However, it would result in the diversion of coal from other modes of transportation--railroads, trucks and barges. The existing transportation industry has proven beyond doubt its ability to move the quantities of coal that will be produced over the next twenty-five or thirty years. Therefore, given the fact that slurry pipelines are not essential, they are not necessarily economical, and they are not necessary for competition, it is difficult to see where the coal slurry promoters can justify any sort of case for the granting of eminent domain power.

In addition to our concerns with respect to transportation, Farm Bureau is likewise concerned about the water resources of the country and the stability that water provides agriculture. Last summer, many drought stricken farmers, from Pennsylvania to Florida, suffered losses of nearly $3 billion. This summer, several states in the Midwest are once again asking the rail and trucking industry for aid in transporting hay to farmers in the drought-plagued Northern regions of the country. In the midst of one of the most disastrous water shortages in years, it is ironic that Congress is actively considering legislation that could divert billions of gallons of water annually from the semiarid Northern Plains in order to transport coal. While drought cannot be attributed to coal slurry, it does dramatize the fragile nature of American agriculture and the need to preserve and enhance our water resources in the future, not drain them.

Moreover, even before the pipelines are built, the bidding for the huge volumes of water needed to operate the pipelines will result in even higher prices and less supply of water for farmers and ranchers in the West and Northern Plains. This use of water to transport coal when a significantly less environmentally damaging mode, the railroad, is available would be a tragic and irreversible waste of one of agriculture's most precious resources.

We are also concerned about the impact coal slurry pipelines will have on rural communities. If coal pipelines are permitted, some railroads will have no choice but to reduce service or abandon many of their rail lines because of unprofitability. Whenever a railroad abandons a branchline, there are several companion effects that impact rural communities. Rail abandonment can mean loss of current employment, loss of income, loss of investment, deterioration of rural roads and bridges, relocation of facilities and increased taxes. It is essential to maintain a strong reliable transportation system, particularly a strong and viable rail system for the shipment of grain and other agricultural commodities. Therefore, we would oppose any action by Congress which would, in the long run, weaken or jeopardize the current rail transportation system.

Mr. Chairman, while the coal slurry pipeline legislation pending before the House and Senate this year has appeared to resolve some of agriculture's concerns, there is no denying the fact that if the legislation is enacted, farmers will bear the burden, yet realize no benefits. The price for coal slurry pipelines will be paid by rural America. It is our land that will be taken; it is our water that will be diverted; it is our rail transportation that will go up in price; and it is our property that will deteriorate. In return for this, we get nothing.

On November 16, 1981, President Reagan stated his position on legislation concerning coal slurry pipelines. In a memorandum to the Secretary of the Interior, the President said, ".....coal slurry pipelines may be an efficient and cost-justified way to move coal, and they should be allowed to compete on their own merits as contributors to improving America's energy situation. I recognize that there may be significant problems in right-of-way acquisition; however, this administration will not support legislation which has been introduced in Congress to provide a federal right-of-eminent domain to override these difficulties."

Farm Bureau supports the President's position with respect to coal slurry pipelines, because we believe that such a decision about eminent domain can, and should, properly be made by the states involved. We urge the committee to defeat S. 801, the "Coal Distribution and Utilization Act of 1987."

Mr. Chairman, we appreciate the opportunity to present the Farm Bureau's views on the question of coal slurry pipelines.

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SENATE COMMITTEE ON
ENERGY AND NATURAL RESOURCES
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September 24, 1987

The Honorable J. Bennett Johnston
Chairman
Committee on Energy and Natural
Resources
SD-364 Dirksen Senate Office
Building
Washington, D.C. 20510

Dear Mr. Chairman:

On behalf of the American Public Power Association and the Western Fuels Association, Inc., I respectfully request that the enclosed statement be included in the Committee's hearing record on S. 801, the "Coal Distribution and Utilization Act of 1987."

Sincerely,

Larry Hobart

Larry Hobart
Executive Director

LH/sm
enclosure

cc: Patricia Beneke

Western Fuels Association, Inc.
Magruder Building
1625 M Street, N.W.
Washington, D.C. 20036

STATEMENT

SUBMITTED ON BEHALF OF
WESTERN FUELS ASSOCIATION INC.
AMERICAN PUBLIC POWER ASSOCIATION

By

ORREN BEATY
Manager, Governmental Affairs
Western Fuels Association, Inc.

TO THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

IN SUPPORT OF S.801, THE COAL DISTRIBUTION AND UTILIZATION ACT OF 1987

September 10, 1987

Mr. Chairman: My name is Orren Beaty, and I am Manager of Governmental Affairs for Western Fuels Association, Inc. We commend you for your sponsorship of this worthwhile and needed piece of legislation.

We have had great hopes that the 100th Congress will be the one to grant the right of eminent domain to those individuals or organizations that seek to build and operate coal pipelines.

If the truth were known, there probably isn't a person in this room, supporter of the bill or opponent, who does not believe that it is a fair proposition -- fair to consumers of coal and electricity, fair to pipeline entrepreneurs and, on its own, intrinsically fair.

It is fair that this potential industry be given the same federal right of eminent domain that has been enjoyed and used advantageously for the public good over many decades by the oil and natural gas pipeline industry, those who build and operate electric transmission lines, and -- of course -- by the railroad industry itself which, sad to say, still seeks to block out competition by opposing H.R. 1531 and its companion bill, S.801, whatever the private views of industry leaders may be as to its fairness. And, of course, the railroads are prepared, through control of their vast network of rights-of-way to block coal pipelines routes from mines to point of use by denying the right to cross.

What this bill does, simply, is put coal pipeline companies on an exactly equal footing -- so far as obtaining necessary rights-of-way is concerned -- with every other method of transporting this valuable energy fuel.

It will not reregulate the railroads.

It will not legislate lower prices for hauling coal.

It does not seek any governmental subsidy.

It might create a competitive situation where coal pipelines are built that will aid consumers of coal and electricity from coal-fired generating stations by reducing power costs proportionately through reduced transportation costs.

Recognizing the last-ditch determination by the railroads to oppose any change in any of the unique advantages they hold over captive shippers of bulk products such as coal because of outmoded laws, we must once again muster the rather obvious arguments in favor of the legislation and tell this Committee what we believe that its members already understand: It is a good bill and should become law.

Western Fuels Association is a not-for-profit cooperative that supplies coal to its consumer-owned electric utility members, rural electric generation and transmission cooperatives, municipal electric systems, and public power districts. Some of our members also belong -- as does Western Fuels -- to the American Public Power Association (APPA), a national service organization for municipally-owned electric systems and other consumer-owned utilities. I am submitting this testimony for both Western Fuels and APPA. This public-minded, consumer-oriented organization has been in the forefront for many years in the fight to obtain fair and competitive freight rates, and Western Fuels is honored to have the opportunity to represent it today in this common cause.

APPA represents more than 1,750 local publicly owned electric systems throughout the country, and its leaders have studied this matter thoroughly and their input has helped shape the legislation this Committee is considering.

APPA is convinced -- as we are -- that the problem of protecting state water rights has been more than adequately taken care of by the bill before you. Opponents of this legislation are seizing on a fancied future shortage of water to mask their real reasons for opposing. Some, like the railroads, don't want new competition. Others really object to mining and use of coal no matter what the nation's energy demands are. They would have you believe that there will be a coal pipeline every few miles, consuming untold billions of acre feet of water annually. It is not true. Each pipeline, as the technical witnesses have testified, uses a really modest amount of water, and unless the railroads stop hauling coal entirely, only a relatively few pipelines are likely to be built.

As a supplier of both coal and transportation services, Western Fuels has had first-hand experience over a twelve-year period with the outrageously high freight rates that are charged where there is no competition -- where a single railroad is the only suitable transportation available, and that railroad exercises its monopoly power.

We own and operate mines in Illinois and Colorado, buy coal from mines in Montana, Wyoming, New Mexico and Illinois, and deliver it or arrange for its delivery to the electric generating plants of our members in Utah, Wyoming, New Mexico, Kansas, Missouri, Louisiana, Minnesota, and, occasionally, in southern Illinois. We have had extensive experience in dealing with a number of Class I railroads. We have learned that where there is a competitive rail line nearby, the rates are cheaper. Lacking a competitive railroad in many areas where the mines or the power plants are located, we have sought other ways of providing competitive transportation, such as coal pipelines.

It does not matter if a pipeline is ready to be constructed now, assuming that S. 801 is enacted this year or next; it is necessary that the federal right of eminent domain be extended to this industry. In the end, built or not, the pipelines will provide competition.

Western Fuels' membership covers parts of every state along the west bank of the Mississippi River and west to the pacific. In delivering or arranging for delivery of coal to power plants along that river from Minnesota south to Louisiana, we have encountered most, if not all, of the problems involved in dealing with railroads. What they say about their freight charges and what we have learned firsthand vary greatly.

We have had to go to federal court in Wyoming because of these problems, involving one railroad and delivery to three different generating stations; we have gone to the Interstate Commerce Commission because of what we viewed as monopolistic pricing in Illinois by another carrier. We are prepared to go both routes in the future, if we have to, but we and other producers and users of coal would prefer that the legal restraints to increased competition be removed by such legislation as we are discussing today. Give the right of eminent domain to the coal pipelines, as it has long since been available to oil and natural gas pipelines, and recourse by shippers to the courts and the ICC would become necessary much less frequently.

The railroad industry not only would continue to deny that right to another transportation mode but also would set itself up as the judge of whether transportation of coal by pipeline -- using a federal right of eminent domain when negotiations for purchase of a right-of-way proved fruitless -- is serving a public purpose. As, for example, was done recently by President William H. Dempsey of the Association of American Railroads; his decision on slurry pipelines is -- not surprisingly -- that they don't serve a public purpose.

To give credence to such a self-serving, unprovable remark would be like taking at face value the words of a masked man in a bank at night to a guard: "You can go on home; no public purpose will be served by hanging around here all night."

It is not just as relates to the pipeline industry that the railroads seek to maintain monopolies they possess -- and make use of to set freight rates at whatever level they decide. When they were pervasively regulated by the ICC in a period 55 to 75 years ago, Congress granted them exemptions from certain key sections of the antitrust laws. Without ever providing specific answers as to why these should be maintained in an era of deregulation, they wrap the tattered garments of poverty about their shoulders and clutch these exemptions as possessively as the Ancient Mariner clutched his listener -- all the while insisting that all they want is to be treated like any other business.

Of course, the industries and businesses that must use the railroads these days to move such bulk products as grain, chemicals, fertilizers, mineral raw materials for a variety of manufacturing purposes, and coal, must observe and obey all of the antitrust laws. But not the railroads.

The Interstate Commerce Commission has agreed on the advisability of removing one of these exemptions that now bars recovery of damages from a railroad that violates antitrust laws in a way that harms the shipper. The ICC -- the regulator -- agrees, but not the deregulated railroads.

It is hard not to believe that the leaders of today's railroad industry still have their minds set on a period before most of us were born and when the industry was fully regulated, forgetting that the Staggers Act and other deregulatory legislation have been passed. Staggers, widely praised by the railroads for removing much of the regulation that existed until 1980, was premised on the view that competition -- rather than regulation -- would determine prices.

But the railroads don't want competition and apparently cannot bring themselves to be competitive. As a result, they have been losing shares of the market and their employee levels have steadily declined. It is not the threat of coal slurry or loss of antitrust exemptions that are hurting the railroads and reducing railroad employment. It is the lack of competitiveness.

This has been happening before and during railroad testimony in a variety of congressional hearings the past four years, first that there are no captive shipper problems and then that even so, captive coal shippers were not being overcharged. Then came decisions that granted electric utilities heavy damages because of overcharging by the railroads: $111.5 million to San Antonio City Public Service, $29 million to Arkansas Power and Light, and $23.5 million to Omaha Public Power District, as major examples. At least four railroads were involved, so it would seem to be more a general pattern of behavior than a single aberration.

On a slightly different subject, one railroad, the Norfolk-Southern, apparently convinced Railway Age magazine that though it is "modestly prosperous", its railroad business "hasn't had a lot to do with it." The New York Times, however, wrote on June 7 of this year that the railroad "reported record net income of $518.7 million last year on revenues of $4.08 billion, and that first-quarter earnings in 1987 -- at $124.8 million -- "also set record."

The conflicting, sometimes contradictory nature of these statements and news stories could conceivably lead one to doubt the credibility of the railroad industry as it pursues its campaign to avoid competition.

Traffic World is a highly regarded weekly magazine covering transportation thoroughly and objectively. I append to my testimony an editorial and editorial cartoon from a recent issue of that publication.

Mr. Chairman, this Committee can start a movement that equalizes conditions between all modes of energy transportation and furthers the aim of letting competition determine fair freight rates. I appreciate the opportunity to get our views before you and urge early action to report S.801 favorably. Thank you.

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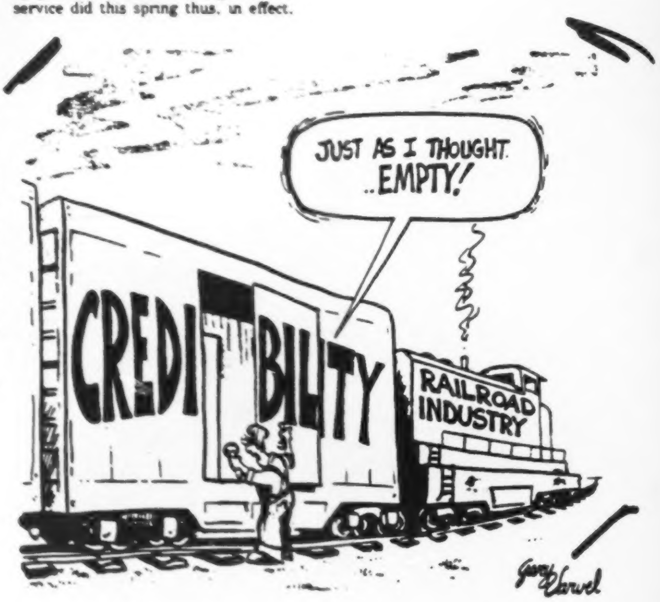
EDITORIAL

Traffic World's Editor Carlo Salzano recently returned from covering a three-day meeting of the Railroad Public Relations Association at the Greenbrier in White Sulphur Springs, W.Va., (and if that doesn't prove the RHIP maxim, we don't know what does) and he notes that credibility of the railroads, or the lack of same, occupied much of the time. Rail labor was present at that meeting of the railroad PR executives and it was apparent, Salzano says, that labor's low opinion of management's credibility hasn't altered much over the years. Union officials say they hear nothing but how strong deregulation has made the carriers while at the same time they see the work force shrinking drastically (the unions are missing a basic point here, but more on that anon). The unions' feelings surely were not improved much by the speech of one rail executive who advised that when railroad "restructuring" is being discussed, personnel reductions be downplayed. While the Greenbrier meeting was progressing, the industry was on Capitol Hill trying to explain how "revenue inadequacy" and a healthy bank account are not mutually exclusive. And, shortly after the meeting, as the ICC was reaching a decision on reconsidering the Santa Fe-Southern Pacific merger, Commissioner Malcolm M.B. Sterrett took a swipe at the SFSP pleading saying that he found it "difficult to give credibility to SFSP's new testimony." At the Greenbrier meeting it was concluded that there is no instant solution to the credibility problem. "Honesty is the best policy. Tell it like it is. Communicate. Include labor in the decision-making process and offer labor a share of the profits" were all voiced at one time or another as possible panaceas. And then, in a brief session on "grass roots credibility" one rail public relations executive, talking about the industry's sincere concern with the safe movement of hazardous materials, insisted that the potential for a catastrophic accident existed daily. Yet a film shown to the same group a little later labeled the possibility of such an accident as "remote." So much for credibility.

* * * *

Bob Kursar, TW's Assistant Managing Editor, wonders in a note to this desk if the trucking industry hasn't again shot itself in the foot, at least as far as Capitol Hill is concerned. That rate increase announcement last month by the Rocky Mountain Bureau should provide shippers with yet another example of why antitrust immunity for collective ratemaking should be abolished. In March, the ICC rejected the RMB request for a 2.9 general rate increase but within days practically every bureau member filed an independent action to increase rates by 2.9 percent. The ICC can take little action against independent rate filings. Shippers asked the ICC to investigate but the RMB withdrew the proposed tariffs for the rejected general rate increase. Two weeks later the bureau filed a 2.9 percent rate increase on joint line traffic, effective July 30. That means prices on RMB interline service could go up just as the rates for single carrier service did this spring thus, in effect, completing RMB's initial plan for a 2.9 percent across the board increase. The ICC probably won't do anything about the shippers' investigation petition and shippers that want to sue RMB are prohibited from doing so by the Keogh Doctrine—the ancient Supreme Court dogma that prohibits private antitrust suits against rate actions that were approved by the ICC. And the RMB joint line rate increase request, if allowed to stand by the ICC, will show other bureaus and their members that collective ratemaking now has a big loophole they can stroll through anytime it's necessary. It could well be a pyrrhic victory, however, because if Congress schedules more truck deregulation hearings late this session or next, collective ratemaking will be a prime subject and shippers will indeed have something to lay on the table.

—D.B.



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Building and Construction Trades Department

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September 15, 1987

Patricia Beneke, Senior Counsel
Senate Committee on Energy
and Natural Resources
364 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Patti,

I am submitting to you, on behalf of Robert A. Georgine and the Building and Construction Trades Department, AFL-CIO, Mr. Georgine's statement in support of S. 801, "The Coal Distribution and Utilization Act of 1987."

I certainly hope that we haven't delayed too long for this to be submitted in the record.

With kind regards, I am

Sincerely,

Tom Owens, Jr.

Tom Owens, Jr.
Legislative Assistant

TEO
Enclosure

Mr. Chairman, Members of the Committee on Energy and Natural Resources:

My name is Robert A. Georgine, President of the Building and Construction Trades Department, AFL-CIO, representing four million building tradesmen in the United States.

It is my pleasure to be here today to testify on behalf of S. 801, The Coal Distribution and Utilization Act of 1987.

This is not the first time I have appeared here to speak on behalf of a bill which would grant federal eminent domain ain to coal slurry pipelines. Indeed, this issue has been before one committee or another of Congress many times since President Kennedy first recommended such legislation in the early sixties, and I have appeared at most of those hearings only to see each successive attempt defeated. If necessary, I will continue to appear until the United States takes advantage of this proven and effective technology and begins to enjoy its many benefits, which include:

1. Hundreds of thousands of jobs in vitally important sectors of our economy.
2. Reduced prices for delivered coal to the advantage of both domestic energy users and the nation's foreign trade imbalance.

3. Cleaner environment.
4. A significant contribution to America's energy independence. And finally,
5. A major contribution to increasing the productivity of the American economy.

America has vast resources of coal; probably the largest reserves in the world. The energy needs of this country and many foreign countries could be supplied from those reserves for hundreds of years provided that we can bring it efficiently and cheaply from the mine mouth to the power plants that are, and will be, the major consumers of coal.

Transportation is the key to increased coal use in this country and to increased exports of coal by the United States. Compared to other energy sources, coal has a low energy-to-bulk ratio. One ton of coal is the energy equivalent of only 4.2 barrels of oil. For larger users, such as power plants, vast amounts of coal have to be delivered and stockpiled to provide for continuous operation Presently, only the railroads with their unit trains can supply such needs. 58.4 percent of the coal moved in the United States travels by rail; the rest is moved by a mix of: barges - 16.5 percent, trucks - 13 percent, and miscellaneous hauling methods - 2.1 percent. Even where those alternative transportation modes are in use, however, trains frequently bring the coal to the loading point, and just as frequently, haul it away from the loading point.

The price of coal hauling by the railroads reflects their monopoly position in the coal hauling business. Although all freight rates have increased dramatically since deregulation, the price of hauling coal has increased significantly more than rates for other commodities. Based on an index in which 1969 equals one hundred, all freight rates had increased to 374.2 by 1985. However, coal freight rates have increased to 403.2, nearly thirty points higher. In the absence of effective competition, there is every reason to think that these pricing practices will continue. They have already contributed to the loss of important foreign coal markets and to a significant increase in the importation of foreign coal by certain domestic utilities in Florida and Texas.

There is a cost effective and proven technology which can be substituted for rail hauling and stockpiling of coal at power plants. Coal slurry pipelines, where appropriate, can deliver coal continuously at about half the cost of rail hauling. Coal slurry pipelines can provide cheaper electricity from those utilities that utilize it, as well as creating an incentive for the railroads to stop their monopolistic price practices on coal hauling. Thus, even in areas not directly served by coal slurry pipelines, consumers would benefit from the competitive effect of lower coal hauling rates.

S. 801 is a vital link in the process of getting coal slurry pipelines into operation in the United States, even though it does not itself authorize or provide for the installation of a single inch of pipeline. By granting coal slurry pipelines access to the federal courts for eminent domain decisions, S. 801 provides a level playing field for coal slurry. Federal eminent domain is extended to interstate electrical transmission lines, to highways, and to gas pipelines. And, of course, the incentive for building the western railroads arose from the greatest exercise in eminent domain in the history of our country.

Thus, giving coal slurry pipelines this access to federal courts is well within the traditions of other interstate activities in America. Without such access, coal slurry pipelines would have to establish eminent domain to cross private lands, including railroad lands, in every state they transit. The costs of such proceedings would go a long way to eliminating any economic advantage from coal slurry technology.

As President of the Building and Construction Trades Department, AFL-CIO, jobs are always at the forefront of my attention. The coal slurry pipelines which are proposed, and which will go ahead if this legislation is enacted, will provide jobs, not only for tens of thousands of building tradesmen, but for workers in even more hard-pressed industries than construction. Millions of tons of steel pipe, valves, and meters will be required to complete these pipelines providing jobs not only in basic steel, but in the metal refining and manufacturing sectors which are now sunk in a deep depression.

Jobs - or a fear of losing jobs - also motivates the opposition to S. 801, but I submit that the opposition is wrong. America's energy policy clearly calls for a substantial expansion of the use of coal for power generation. The continuing public battle over nuclear energy has paralyzed expansion of that energy alternative. At the same time, we do not want to further expand our dependence upon imported oil, which in any case, is more valuable as industrial or pharmaceutical feedstock.

Thus, we are left with an increased use in coal. Like a rising tide which lifts all boats, our future energy needs will expand the market for coal and preserve jobs in the railroad industry. We can also expect to achieve an increase of jobs in the export market. Coal slurry technology has the potential for making America competitive again in international markets.

America's vast supplies of coal could be the basis for a lively export industry to an energy hungry world. Such an industry would not only provide thousands of jobs for Americans workers, but it could make an important contribution to eliminating our unfavorable balance of trade. Instead, however, we find that the high cost of transporting American coal to shipping ports for export overseas has driven us out of the world market. Even more maddening, it has caused domestic users of coal to turn to foreign sources because they can no longer afford to purchase American coal.

The environmental effects of coal slurry pipelines are also attractive. America is laced with underground pipelines that are never noticed after they are buried and into operation. Farmers grow crops on pipeline right-of-ways and roads and railroads cross over them without the slightest hesitation. Pipelines are a quiet, unobtrusive way of moving goods to market without significant environmental disruption. In this, as in price, no one can argue that coal slurry pipelines compare very favorably to your average railroad right-of-way.

The only adverse environmental effect of coal slurry pipelines are the high rate of water use which becomes important when we realize that much of our coal reserve is in the water short areas. S. 801, wisely, I think, resolves this problem by leaving the water permitting process to the states. Coal slurry pipelines will not only have to meet the requirements of every federal environmental law Congress has passed, it will also have to satisfy the most stringent water use requirements that any state sees fit to enforce.

Finally, I think we should reflect upon the question of coal slurry pipelines in light of an ongoing debate that has preoccupied this country in recent years. Much has been said about the failure of America's productivity growth and questions have been raised about this country's ability to compete in world markets or indeed, to compete in some of our own domestic markets. Coal slurry pipelines offer us a proven, cost-effective technology that will improve this country's productivity in a significant part of the economy. No nation has ever suffered from adopting new technology, and no economy failed to suffer from the suppression of such technology. Congressional action on S. 801 will go a long way toward answering these questions either positively or negatively.

Thank you.

International Union of Operating Engineers
1125 SEVENTEENTH STREET NORTHWEST ★ WASHINGTON, D. C. 20036
AFFILIATED WITH THE AMERICAN FEDERATION OF LABOR AND CONGRESS OF INDUSTRIAL ORGANIZATIONS

OFFICE OF GENERAL PRESIDENT ● (202) 429-9100

September 21, 1987

The Hon. Bennett Johnston
COMMITTEE ON ENERGY AND
NATURAL RESOURCES
SD-364 Dirksen Senate Office Bldg.
Washington, D.C. 20510

Dear Chairman Johnston:

Enclosed herewith is the testimony of the International Union of Operating Engineers in support of S. 801, The Coal Distribution and Utilization Act of 1987.

Sincerely,

LARRY DUGAN, JR.
GENERAL PRESIDENT

John J Brown

John J. Brown
Director of Legislation

JJB/kmg
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International Union of Operating Engineers
1125 SEVENTEENTH STREET NORTHWEST ★ WASHINGTON, D. C. 20036
AFFILIATED WITH THE AMERICAN FEDERATION OF LABOR AND CONGRESS OF INDUSTRIAL ORGANIZATIONS

OFFICE OF GENERAL PRESIDENT • (202) 429-9100

TESTIMONY

OF THE

INTERNATIONAL UNION OF OPERATING ENGINEERS

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES

UNITED STATES SENATE

SEPTEMBER 10, 1987

International Union of Operating Engineers
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The International Union of Operating Engineers, representing over 360,000 workers primarily in the construction industry throughout the United States and Canada, has been a long-time supporter of coal slurry pipelines. We support S. 801, The Coal Distribution and Utilization Act of 1987, and commend Chairman Bennett Johnston for his timely introduction of this vital piece of legislation.

In previous sessions of Congress, the Operating Engineers have been at the forefront of efforts to obtain Federal eminent domain privileges which would allow the private sector to determine, on a cost effective, competitive basis, the feasibility of this mode of coal transportation in particular markets. With our counterparts in the building and construction crafts, electrical generating utilities, engineering and construction firms, as well as pipeline transmission companies, we will continue to demonstrate the economic, energy and environmental soundness of coal slurry pipelines. The introduction of S. 801 signals the renewal of our efforts on this critical energy issue.

While not directly testifying at the Committee hearings on S. 801, the International Union of Operating Engineers desires to associate ourselves with the testimony of the proponents of this bill - in particular the remarks and rationale of the United Associaton of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada, and the Slurry Technology Association.

Coal slurry pipelines offer an alternative long-haul transportation system to the railroads. Developers of proposed coal pipelines have sought Federal eminent domain authority to ease the acquisition of rights-of-way, particularly since pipeline routes must frequently cross railways and railroad controlled property and railroads have refused to permit coal pipelines right-of-way. Legislation has been introduced in the past several Congresses to give coal pipelines eminent domain authority, but strong opposition by the railroads has resulted in killing these bills.

Legislation previously considered by the Congress has included a mechanism by which an interstate coal pipeline can prove it is in the national interest and thereby obtain the right of eminent domain. Proposed legislation has included eminent domain provisions, strict state water rights protection language, regulatory language, and safety provisions. Various proposed legislation has considered the ICC, FERC, and the Secretary of the Interior as the entity which would make the national interest determination. Railroads and oil pipelines enjoyed federal eminent domain during the days in which they were being constructed: natural gas pipelines and interstate electric transmission lines still retain the right of federal eminent domain.

The sponsors of several proposed pipeline projects, most notably the ETSI System, have attempted to gain the right of access, or eminent domain, on a state-by-state basis either through the state legislatures or through the courts. The process is time consuming and expensive and there is no guarantee that state laws will mesh and allow an interstate system to be constructed.

After ten years and sixty seven lawsuits, as ETSI was reaching the stage where building was feasible, the system was successfully outbid for its coal traffic by lower rail rates and the project was dropped. The cost of moving coal by this pipeline, had ETSI had federal eminent domain and been built when originally proposed, most likely would have been lower than rail rates for the comparable shipments. The utility shipper stated that the contract rail rate compared to the then posted rail tariff provided transportation savings of $16.5 billion over a twenty year contract life.

Coal pipelines would offer competition to the railroads for export coal shipments: presumably any economic alternative shipping system would have the effect of increasing competition and generally lowering inland transportation costs. In fact, the existence of competition created by the enactment of federal eminent domain legislation would tend to moderate rail rates whether specific coal pipelines were actually built or not.

The Black Mesa Pipeline, the one long distance coal pipeline operating in the U.S., transports approximately five million tons per year for 273 miles from Kayenta, Arizona, to the Mohave Power Plant in southern Nevada. The Black Mesa pipeline, which started operation in late 1969, has had a 99% deliverability capacity and is delivering its coal at 1.4 cents/ton mile.

Underscoring the potential savings to utility ratepayers from coal slurry pipelines is a recent study conducted by the Energy Information Administration of the U.S. Department of Energy (April, 1985). Using computer modeling techniques, the EIA concluded that "coal pipeline rates would be considerably lower" than rail rates. The study found that the construction of four coal pipelines could save electric utilities and consumers nearly $1 billion by 1995. Additionally, the report found "railroad revenues from coal carriage would still be almost 60 percent higher and railroad ton-miles nearly 30 percent higher in 1995 than in 1984."

An interesting advancement in coal slurry technology is the development of coal slurry fuels: a heavy mixture of coal, water, and small amounts of additives which can be direct-fired without dewatering. Coal slurry fuels are presently being test fired worldwide and will provide additional economic incentives to the use of integrated systems piping a coal slurry fuel to its destination, presumably an electric power plant or a port, where the coal slurry fuel can be handled with the ease of handling petroleum products. There is presently one long distance coal slurry fuel pipeline under construction (162 miles long) in the Soviet Union and plans for two $5-10 billion coal-water slurry pipelines that would stretch 2,500 km from central Siberia to the Ural mountains. Plans for additional utilization of coal slurry fuel pipelines are on the drawing board in China, Japan, and India. Additionally, there are plans for a coarse coal receiving facility at the Port of Rotterdam and construction has been completed for coal slurry tankers by the Japanese.

The legislation in Congress has never provided financial incentives such as loan guarantees for coal pipeline construction, nor do the owners of proposed projects desire it. The legislation simply allows coal pipelines the right to enter the market place and to compete against the railroads and other carriers for coal haulage business.

Without doubt, the construction of coal pipelines for use domestically and for export has been delayed by the low prices of oil products. However, most producers of coal slurry fuels feel that there are markets for their products when the price of oil reaches $15-20/bbl. Passage of eminent domain legislation will simply create a climate in which those pipelines that are economically feasible can put together a project; without such legislation we cannot expect corporate interests to pursue projects after the costly ETSI experience mentioned above.

The options are clear: if we continue to allow railroads to block potential competition by doing nothing, major coal pipeline systems will not be built in the U. S. In order for coal pipelines to obtain their rights-of-way and enter the market place, Congress must enact eminent domain legislation. Without Congressional action, we could well observe foreign governments benefitting from a technological innovation that we do not allow ourselves to enjoy. Clearly it is in the best interest of the U. S. to have the option available to pursue alternative coal transportation mechanisms and thereby increase domestic and foreign consumption of U. S. coal.

As can be seen from the foregoing examination of some of the benefits of coal slurry pipelines, a strong argument can be made for the importance and desirability of Federal eminent domain legislation. While our immediate interest is in increased job opportunities which an expanding coal market will provide for Operating Engineers and other workers in the coal extraction and transportation industries, it should be noted by all objective observers that S. 801 is carefully crafted to address environmental, water usage and Federal budgetary concerns. Simply put, vested economic interests - namely, railroads - should not be permitted to obstruct legitimate and fair competition for the haulage of coal. The International Union of Operating Engineers urges a complete and careful review of S. 801 by each United States Senator. We are confident that such a review will result in the passage of S. 801 into law.

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LABORERS' INTERNATIONAL UNION
of NORTH AMERICA

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September 14, 1987

Honorable J. Bennett Johnston, Chairman
Senate Committee on Energy & Natural Resources
SD-358
Washington, D. C. 20510

Attention: Patricia Beneke

Dear Senator Johnson:

I write to you at this time to ask that the attached statement be included as part of the hearing record on S.801, the Coal Distribution and Utilization Act.

With kind regards, I am

Sincerely yours,

JACK CURRAN,
Legislative & Political Director

JC/efr

Attachment

TESTIMONY PRESENTED TO THE
SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES

BY ANGELO FOSCO, GENERAL PRESIDENT

LABORERS' INTERNATIONAL UNION OF NORTH AMERICA

SEPTEMBER 10, 1987

Mr. Chairman, Members of the Senate Committee on Energy and Natural Resources, my name is Angelo Fosco and I am General President of the Laborers' International Union of North America, representing approximately one-half million building and construction laborers.

I am pleased to join with my colleague, President Boede, in support of S.801, not only because the members of my union are key workers in the pipeline industry, but also for the high level of other benefits which arise from coal slurry. Safe, clean transportation of coal at stable prices is the key to developing this vast natural resource of America. Currently, the rail transportation monopoly on long distance coal hauling has resulted in a ludicrous situation. The price of delivered American coal is so high that we are priced out of international markets and we are even beginning to price ourselves out of the domestic market. Utilities in Florida and Texas are already finding it cheaper to import coal than to use the available domestic supply. It is ludicrous, I say, when the nation with the largest coal reserve, in an energy hungry world, becomes an importer of coal.

S.801 is not a bill designed to build coal slurry lines, but rather to remove a key obstacle to their construction. The right to eminent domain in federal courts is common to all forms of interstate transportation from electric lines to highways, so nothing unusual is being requested by S.801. Failure to pass it, however, will be a setback from which coal slurry will probably never recover. If an interstate pipeline has to achieve eminent domain by fighting the battle with the railroad in the courts of every state the pipeline traverses, lawyers' fees alone could well make coal slurry non competitive.

Environmentally, coal slurry pipelines are the best bargain we can get to perform the vital function of transmitting an expanded coal supply cross country. Once a pipeline is buried, it creates no traffic hazards, pollutes no land, and disturbs no one. In fact, most normal human activities go on every day along pipeline right of ways of which people are blissfully aware.

In addition to the tens of thousands of jobs that will be produced for laborers and other building tradesmen by the seven slurry lines now projected, there will be jobs in other key industries that will be especially beneficial to America. The depressed steel industry will be called upon to produce 12 million tons of steel pipe, as well as valves, fittings, and the other equipment that goes into a pipeline. Transportation jobs for supplies and material, administrative and maintenance jobs when the pipelines are in operation can also be classed as a product of S.801, but the most important result of passing this bill will be to put America into the technological mainstream in coal transportation. This nation has been a leader in technology for most of its history and the ever increasing productivity of the American economy has been its most beneficial aspect. There has been much debate of late about America losing its technological edge and even questions about our future competitiveness in world competition. Passage of S.801 will be a clear signal that these questions are invalid and that America intends to continue at the forefront of technological advancement.

NRECA NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
1800 Massachusetts Avenue, N.W., Washington, D.C. 20036
Telephone: (202) 857-9500

September 16, 1987

Honorable J. Bennett Johnson, Chairman
Senate Energy and Natural Resources
  Committee
364 Senate Dirksen Office
  Building
Washington, D. C. 20510

Dear Mr. Chairman:

Enclosed are five (5) copies of testimony in support of S. 801, the Coal Distribution and Utilization Act of 1987. I respectfully request that the statement be included in the Committee's record for the September 10, 1987 hearing on the bill.

Thank you for your consideration.

Sincerely,

Bob Bergland

Bob Bergland
Executive Vice President

BB:vs

Copy: Patricia J. Beneke, Senior Counsel
      Committee on Energy & Natural Resources

NRECA NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
1800 Massachusetts Avenue, N.W., Washington, D.C. 20036
Telephone: (202) 857-9500

Statement of
National Rural Electric Cooperative Association
Before the
Committee on Energy and Natural Resources
United States Senate
S. 801 - The Coal Distribution and Utilization Act of 1987

September 10, 1987

Mr. Chairman and members of the Committee, the National Rural Electric Cooperative Association (NRECA) is the national service organization representing more than 1,000 consumer-owned rural electric systems in 46 states, delivering electric power to 25 million people in the rural and sparsely populated areas of 2,600 of the nation's 3,100 counties. We wish to express our continued support of coal pipeline legislation and more specifically S. 801, the Coal Distribution and Utilization Act of 1987.

The industrial development of the United States has resulted in a socially and technologically complex society in which the interdependent rural and urban needs for an adequate transportation system or network must be addressed. The national need for energy, food, fiber, minerals, raw materials and manufactured products requires a transportation system which will provide adequate supplies of these products in the right place at the rignt time. All modes of transportation including railways, waterways, highways, petroleum and gas pipelines, and transmission lines, as well as transfer facilities, must be considered as an integrated system. We believe favorable Congressional action on S. 801 would provide a viable and competitive alternative for moving the growing tonnages of coal needed for the production of electricity.

The need for a viable, competitive transportation system is timely and relevent in light of the continuing instability of supply and pricing of petroleum products and the dependence on coal continues to be the key fuel of our electrical energy supply. Rural electric systems depend upon coal for more than 80% of their generating capacity. We believe favorable action on S. 801, that gives the builders and operators of coal pipelines the same rights as are now enjoyed by electric utilities, railways and other common carrier industries, enhances the national good.

At NRECA's 45th Annual Meeting held in February 1987, our membership reaffirmed their belief in the need for such legislation by acting favorably on the following policy resolution in support of coal pipelines:

COAL SLURRY PIPELINES

> Delivery costs are a substantial portion of total fuel costs and coal is a vital commodity in the solution of future energy supply.

> In the interest of maintaining a competitive atmosphere throughout industry in the country the transportation of coal for the benefit of electric power consumers inures to the continuing stabilization of the national economy.
>
> The transportation of coal by slurry pipelines appears to be one method of low-cost transportation which can supplement other methods of transportation. The use of coal slurry pipelines shall not infringe upon the existing rights of states and/or other entities as to their water rights, hydroelectric power production and costs and rights to recapture water not used for the specific purpose. The right of eminent domain should be made available for the construction and operation of pipelines and such pipelines should be subject to the rights, rules and regulations of all common carriers transportation systems.

As you are undoubtedly aware, our membership is vitally concerned with state water rights. S. 801 explicitly allows states to retain control of the issuance of water permits. Indeed, the proposed legislation gives states additional control over their water. We feel the protection afforded by the bill meets our members' agricultural interests as well as their electrical power generating needs.

First, the volume of water needed for a coal pipeline is not great. One alternative method of using the same coal for electrical generation would be a mine-mouth powerplant. Engineering and environmental estimates show that this alternative would require at least 5 times more water for cooling towers than a pipeline would require to accommodate the same amount of coal.

Secondly, pipelines can use water that would otherwise be unusable. For example, non-potable, brackish, or even secondarily-treated waste water unusable for human consumption or agricultural irrigation can be used by coal pipelines. In fact, this could alleviate a community's waste water disposal problems.

Finally, S. 801 mandates that state substantive and procedural water law, including existing and future interstate compacts shall govern all issues relating to the acquisition of water by coal pipelines. Under the language of S. 801, a state could deny water for a pipeline's use or mandate explicit terms and conditions for the water's use. For example, if there were a drought, a coal pipeline's water supply could be interrupted for other uses as specified in the terms and conditions.

We believe coal pipelines should be afforded the opportunity to compete with other modes of transportation. Alternative coal transportation options are severely limited. When economically feasible, utilities may use truck transportation but only for short distances and barges may be used where rivers and harbors are accessible, but each of these options has a specific and limited application. Currently, two-thirds of all coal is shipped by rail and, of this amount, 85% iscaptive to a single rail line. By the end of the century, railroads are expected to carry 90% of all coal being transported. Coal pipelines will neither put the railroads out of business, nor will they displace rail workers. It is estimated that coal pipelines will *carry less than 10%* of this Nation's coal requirements. Railroads and their employees will continue to benefit from carrying more coal in the future than they currently haul. The only difference is that railroads will not be permitted to haul *all* of the coal *without competition*.

Specifically we have found that the Interstate Commerce Commission has provided wholly inadequate regulatory protection for captive coal shippers under the authority given them in the Staggers Rail Act. Rural electric members, as well as the entire electric utility community, need to ensure competition in the transportation of coal.

In fact, NRECA's membership is so concerned about the inadequate actions by the ICC that it is also supporting the enactment of the Consumer Rail Equity Act (S. 676) and the Clayton Act Amendments (S. 443). The lack of regulatory and legal redress over uncompetitive rail pricing and service practices leaves bulk coal shippers, like our members, with few alternatives save for legislative changes to promote and preserve transportation competition.

In conclusion, Mr. Chairman, this is why the membership of NRECA so vigorously supports the enactment of S. 801, the Coal Distribution and Utilization Act. Coal pipelines would provide a lever that will ensure reasonable rail transportation costs. Free markets are the best way to create a competitive environment. We believe that coal pipelines will be a tremendous asset to create and nuture a healthy coal transportation environment.

Thank you for your consideration and the opportunity to present the views of the National Rural Electric Cooperative Association in support of S. 801.

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